Determinants of Cesarean Deliveries in Pakistan

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Introduction

- A major surgical procedure
  - Medical justifications
  - To save maternal and neonatal life

- No more than 10-15% deliveries are justifiable by C- Section- World Health Organization
  - Less than 5% of C- Section in any population indicates the low antenatal and maternal care (World Health Organization et al. 2009)

- Institutional deliveries show a high rate of cesarean section in Pakistan
  - CHM Rawalpindi in 2011-12………………………………….56%
  - Holy family hospital Rawalpindi in 2008……………..45%
  - Ayub Medical College in 2006-07……………………….35%
  - Ganga Ram hospital in 2000-01…………………………21%

Introduction (Contd…)

- In Pakistan patient have to pay more than double for C section delivery than normal delivery-wide deviation exists as it depends upon the facility and physician profile
- High rates of C-Section have two serious implications
  - Pressure on the hospital surgical equipment and human resource
  - High physical and psychological cost on woman
    - C section deliveries are considerably at high risk of future medical complications (Jose et al. 2007)
    - Additional threat of adverse outcome in second pregnancy-high risk of preipartum hysterectomy and placenta accrete, placenta praevia and very preterm birth (Perveen 2011)
  - C- section delivery is associated with increased risk of severe postnatal depression (Torkan et al. 2005)

Introduction (Contd…)

- Main broad determinants of preforming and utilizing C-Section deliveries
  - Medical condition on which doctor takes decision of conducting C-Section
  - Non-medical reasons i.e. economic socio cultural
  - Institutional capacity to conduct cesarean deliveries

- Medical indications-repeated caesarean, presumed foetal distress, failure to progress, breach births, hypertensive disorders, antepartum hemorrhage, near birth complications, postdate pregnancy etc (POST 2002, Shamshad 2008,Jabeen et al. 2013)
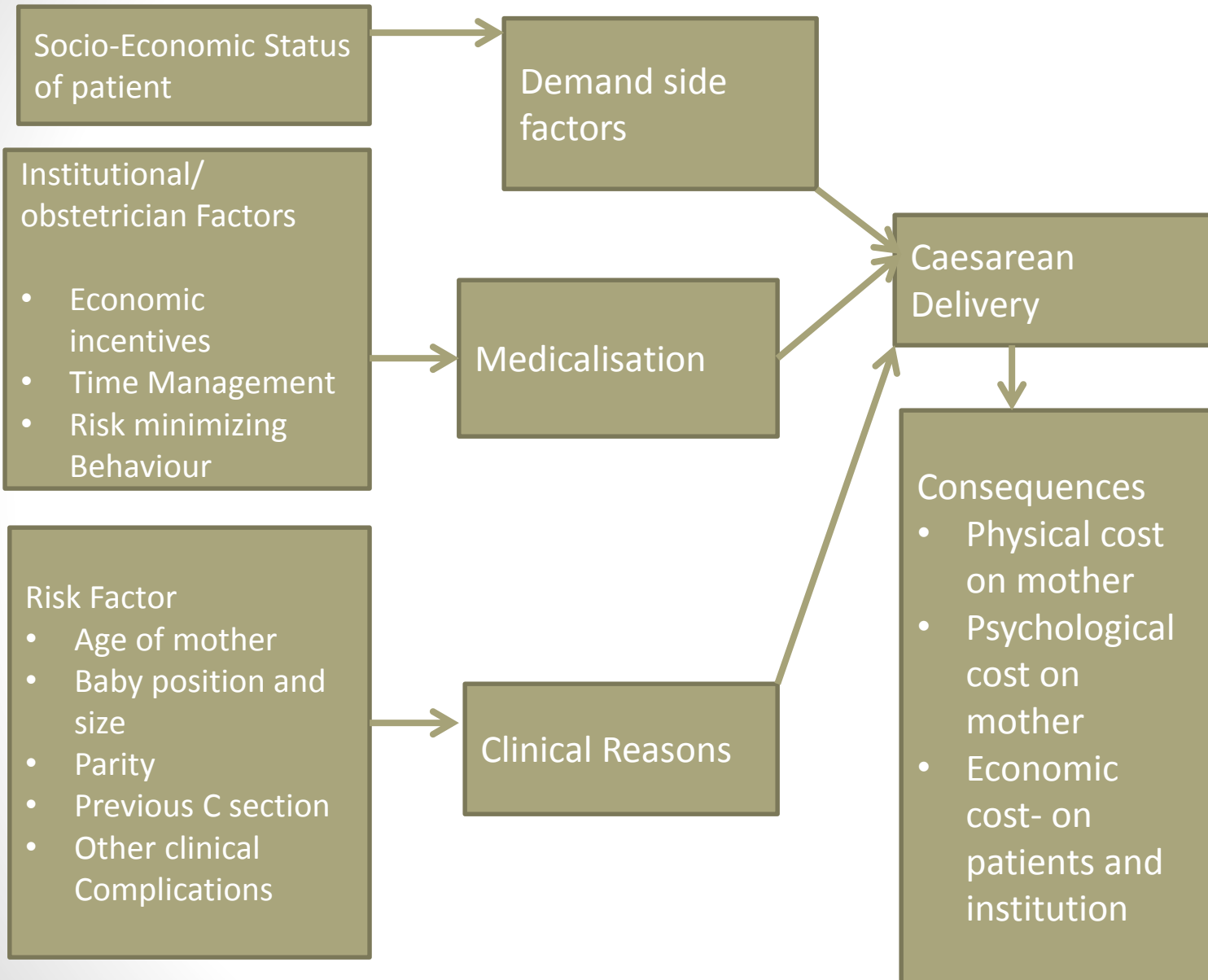
Introduction (Contd...)

- Non-medical reasons
  - Doctors schedule C-Section for economic gains, time management, minimizing risk factor, or for surgical practice. (Tussing and Wojtowycz 1992)
  - The capacity of health system and financing along with its human resource profile are found to be significantly influencing the C section rates (Lauer et al. 2010).
  - Demographic socio-economic profile of the patients-older mother, highly educated woman, first pregnancy, who have received antenatal care during pregnancy, ever terminated pregnancy (Yassin and Saida 2012; Rachatapantanakorn and Tongkumchum 2009).
  - Women demands for C- Section delivery because of fear of long labor and viginal delivery pain

Introduction (Contd…)

- In developed countries C-Section deliveries -----on patient's choice
- In Pakistan decision on medical grounds ------high rates of C-Section?

- The international Federation of Obstetricians and gynecologist (FIGO) in their statement about Caesarean Section state that

'Some countries have experienced increasing recourse to Caesarean delivery for non-medical indications. FIGO considers surgical intervention without a medical rationale to fall outside the bounds of best professional practice. Caesarean delivery should be undertaken only when indicated to enhance the well-being of mothers and babies and improve outcomes' (FIGO 2014)

Analytical Framework

Socio-Economic Status of patient

Institutional/ obstetrician Factors

- Economic incentives
- Time Management
- Risk minimizing Behaviour

Risk Factor
- Age of mother
- Baby position and size
- Parity
- Previous C section
- Other clinical Complications

Demand side factors

Medicalisation

Clinical Reasons

Caesarean Delivery

Consequences
- Physical cost on mother
- Psychological cost on mother
- Economic cost- on patients and institution
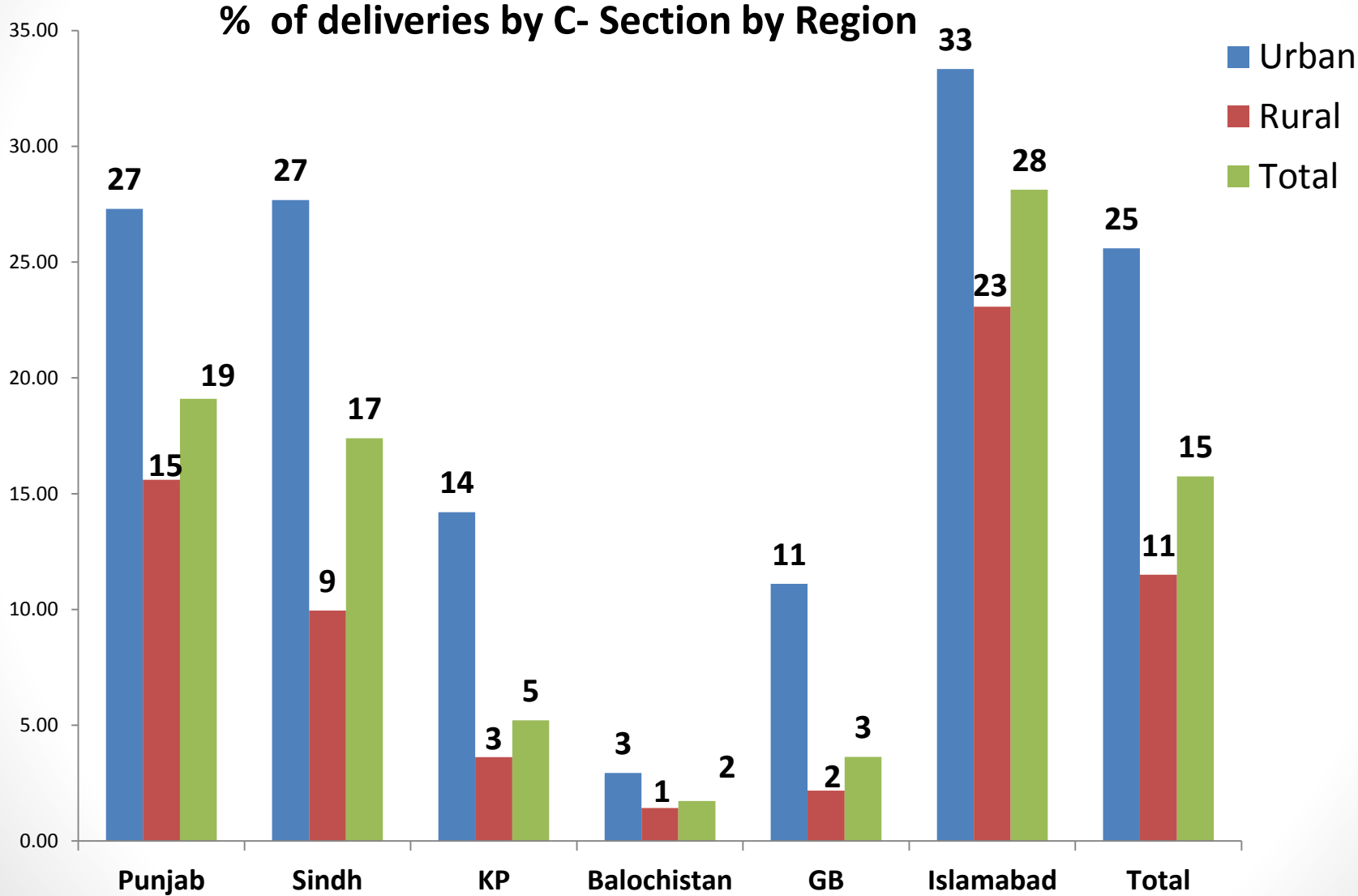
Source: Adapted from Ghosh 2010.

Data and Methods

- Pakistan Demographic and Health Survey 2012-13- comprehensive information on demographic, maternal and child health indicators

- Variables- socio economic and clinical reasons-data related to medicalization related factors are not available

- Analysis is done for the women with most recent birth in past five years (sample size 7439)

  - C Section in recent birth, would most probably have C section in previous birth- this impact could be captured among clinical reasons

  - Data on antenatal care has been collected for the most recent birth from the women who have more than one live birth in last five years
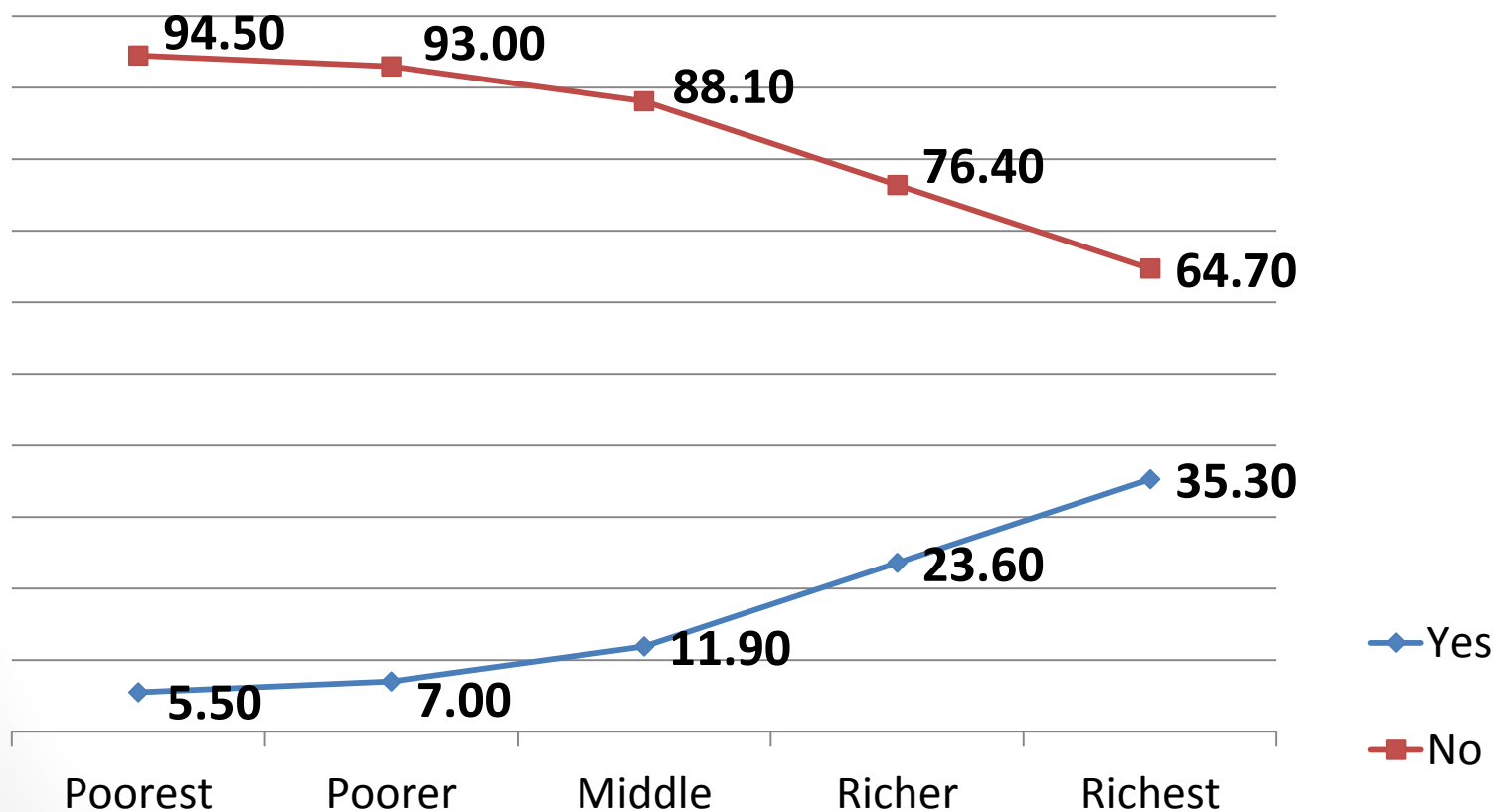
Data and Methods (Contd..)

- Both bivariate and multivariate analysis ------logistic regression model

- Dependent Variable-------Mode of Delivery (0 is coded for the vaginal deliveries and 1 is for the cesarean delivery)

- Independent Variable
  - Mother age at delivery, birth order, place of antenatal care, place of delivery, BMI of women (current as not available for delivery time), wealth index of household, women education, terminated pregnancy ever, number of antenatal visits, size of child at birth, women working status, region, province, and previous C section delivery

Cesarean deliveries in Pakistan

% of deliveries by C- Section by Region

Cesarean deliveries in Pakistan

C section deliveries by quintiles (%)

	Poorest	Poorer	Middle	Richer	Richest
No	94.50	93.00	88.10	76.40	64.70
Yes	5.50	7.00	11.90	23.60	35.30

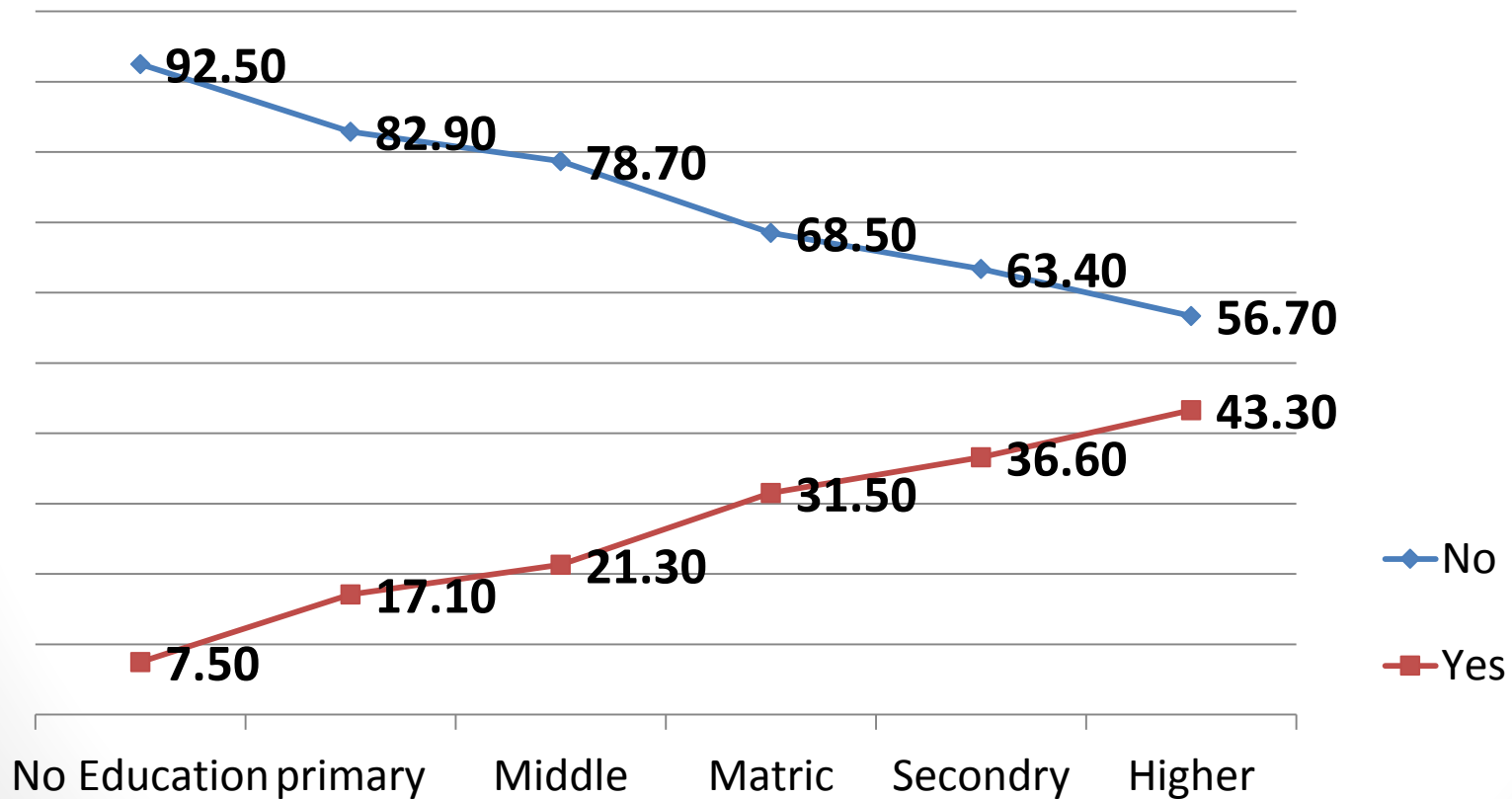# Cesarean deliveries in Pakistan

C section deliveries by Education (%)

Cesarean deliveries in Pakistan

C section deliveries and Place of delivery by region (%)				
region		Public/Govt.	Private	Total
Urban	Yes	**35.90**	**36.40**	25.70
	N	502	1085	2237
Rural	Yes	**23.50**	**27.70**	11.50
	N	631	1619	5194

Determinants of C- Section deliveries in Pakistan

Independent Variables	model 1 (Clinical)	
	regression coefficient (b)	odd ratio
Clinical reasons/ Risk factor		
Age at Delivery	0.071	1.073***
Previous C- Section		
Yes	3.886	48.69***
Terminated Pregnancy ever		
Yes	0.055	1.057
Told about pregnancy complications		
Yes	0.439	1.55
Size of the child at birth		
Average		
Large	0.271	1.311
small	0.188	1.207
Birth Order		
1		
2	-1.1	0.333***
3+	-1.833	0.16***
Women BMI		
Health Weight		
Under Weight	0.421	1.524*
Over Weight/ Obese	1.123	3.073***

Determinants of C- Section deliveries in Pakistan		
	model 2 (Socio-Economic)	
Independent Variables	regression coefficient (b)	odd ratio
Socio Economic Factors		
Province/Region		
Punjab		
Sindh	-0.443	0.642***
KP	-1.258	0.284***
Baluchistan	-1.393	0.248**
GB	-1.55	0.212*
Islamabad	-0.691	0.501
Place of Residence		
Urban	0.143	1.153
Wealth Index		
1 (poorest)		
2	-0.134	0.875
3	0.155	1.168
4	0.502	1.652**
5 (Richest)	0.504	1.655**
Working Women		
Yes	-0.198	0.82

Determinants of C- Section deliveries in Pakistan		
	model 2 (Socio-Economic)	
Independent Variables	regression coefficient (b)	odd ratio
	Socio Economic Factors	
Antenatal care during pregnancy		
Govt.		
Private	0.457	1.58
Home	0.323	1.382**
Mix	0.24	1.271
Antenatal Visits during Pregnancy		
No visits		
<=2	0.299	1.349**
3 or more	0.685	1.985***
Women Education		
No education		
Primary	-0.135	0.874
Middle	0.21	1.234
Matric	0.327	1.387*
College/higher	0.437	1.548**
Place of Delivery		
Govt.		
Private	-0.133	0.875
Home	-20.16	0

Determinants of C- Section deliveries in Pakistan		
	model 3 (All Factors)	
Independent Variables	**regression coefficient (b)**	**odd ratio**
Clinical reasons/ Risk factor		
Age at Delivery	0.033	1.034*
Previous C- Section		
Yes	3.665	39.068**
Terminated Pregnancy ever		
Yes	-0.123	0.884
Told about pregnancy complications		
Yes	0.3	1.35*
Size of the child at birth		
Average		
Large	0.181	1.199
small	0.353	1.423
Birth Order		
1		
2	-0.936	0.392***
3+	-1.313	0.269***
Women BMI		
Health Weight		
Under Weight	0.374	1.453
Over Weight/ Obese	0.853	2.347***

Province/Region		
Punjab		
Sindh	-0.29	0.748
KP	-0.971	0.379***
Baluchistan	-1.253	0.286
GB	-1.019	0.361
Islamabad	-0.687	0.503
Place of Residence		
Urban	0.493	1.636*
Wealth Index		
1 (poorest)		
2	-0.68	0.507
3	0.019	1.019
4	0.473	1.605
5 (Richest)	0.329	1.39
Working Women		
Yes	0.177	1.194

Determinants of C- Section deliveries in Pakistan		
	model 3 (All Factors)	
Independent Variables	**regression coefficient (b)**	**odd ratio**
Antenatal care during pregnancy		
Govt.		
Private	0.86	2.364
Home	0.342	1.408
Mix	0.054	1.056
Antenatal Visits during Pregnancy		
No visits		
<=2	0.119	1.127
3 or more	0.694	2.002**
Women Education		
No education		
Primary	-0.346	0.707
Middle	-0.336	0.715
Matric	0.201	1.222
College/higher	0.214	1.239
Place of Delivery		
Govt.		
Private	-0.301	0.74
Home	-20.2	0

Concluding the outcome….

- Bivariate analysis- important factor determining mode of delivery- area of residence, educational and wealth profile of woman
- Multivariate analysis
  - Clinical factors are turn out to be most important determinants and they should be
  - Among socio-economic determinants women living in Punjab (m1), in urban area (m3), having higher education (m2), being rich and richer (m2)and had more than 3 visits during pregnancy (m3) are more likely to have C section in recent birth
- We cannot say that women of urban, educated and wealthy background opt for C section, or women of these characteristics are targeted by physicians and facilities but further research can investigate why this population segment is having more C section deliveries
- Data on institutional factors is desirable to capture non clinical determinants of C Section

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THANKS!

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