Supplementary files:

Table S1 Place of women giving birth by urban and rural and by region, 2008-2018 (%)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of births	786	1852	1981	2219	2815	2462	1921	1768	2430	2819	2000
Rural											
County or higher level hospital	50.7	52.1	57.2	59.3	61.8	60.6	64.1	65.8	69.3	70.6	68.0
Maternal and child health hospital	21.8	19.8	18.1	21.6	18.3	20.0	17.9	16.7	15.5	17.2	20.6
Township/community health center	27.5	28.2	24.6	19.1	19.9	18.0	11.9	10.3	8.8	5.9	6.7
Private hospital	0	0	0	0	0	1.4	6.1	7.1	6.4	6.3	4.7
Urban											
County or higher level hospital	52.0	57.6	56.1	58.7	61.0	61.0	57.7	58.2	60.4	63.4	63.8
Maternal and child health hospital	34.7	29.7	31.8	31.4	30.6	29.6	29.5	29.3	28.0	26.7	27.3
Township/community health center	13.3	12.7	12.1	9.8	8.4	7.4	6.5	5.9	5.2	4.1	3.0
Private hospital	0	0	0	0	0	2.0	6.2	6.6	6.4	5.8	5.9
East											
County or higher level hospital	50.9	55.5	58.2	61.4	64.7	58.9	65.3	64.9	66.2	67.4	67.3
Maternal and child health hospital	27.3	23.2	22.2	24.5	20.4	24.9	23.0	21.3	21.7	22.0	22.5
Township/community health center	21.8	21.3	19.6	14.1	14.9	15.6	8.5	9.7	7.6	7.1	6.1
Private hospital	0	0	0	0	0	0.6	3.2	4.1	4.5	3.6	4.1
Central											
County or higher level hospital	50.8	52.4	55.0	55.6	58.3	63.3	57.8	58.8	60.3	66.4	64.7

Maternal and child health hospital	29.1	25.4	26.0	28.3	26.3	22.5	26.5	25.5	24.4	22.0	22.9
Township/community health center	20.2	22.2	19.1	16.1	15.4	11.5	7.7	5.2	5.9	2.5	3.8
Private hospital	0	0	0	0	0	2.6	8.1	10.5	9.4	9.0	8.6
West											
County or higher level hospital	52.1	56.2	56.9	60.1	61.5	60.3	58.2	61.0	64.8	65.8	64.4
Maternal and child health hospital	26.5	24.7	26.2	25.1	25.1	26.1	23.3	23.9	22.6	23.4	27.8
Township/community health center	21.4	19.1	16.9	14.8	13.4	11.8	10.7	8.6	6.3	4.4	3.5
Private hospital	0	0	0	0	0	1.8	7.8	6.6	6.3	6.4	4.3

Table S2 Proportion of women who had caesarean section (CS) reporting recommendation by others and own request for CS by location and regions in China, 2008-2018 (%)

Characteristics	2008-2009	2010-2012	2013-2015	2016-2018	P value
	n=1059	n=2912	n=2794	n=3208	
Urban					
Parity 1					
Women request	36.8	29.0	27.9	22.2	<0.001
Husband	0	0	1.6	14.7	<0.001
Doctor	62.3	70.1	69.9	75.5	<0.001
Others	0.9	0.86	0.6	0.86	0.899
Parity ≥2					
Women request	31.7	28.6	30.1	30.5	0.858
Husband	0	0	1.4	1.3	0.032
Doctor	65.5	70.7	67.0	67.4	0.564
Others	2.8	0.6	1.5	0.8	0.182
Rural					
Parity 1					
Women request	33.5	32.3	28.0	29.4	0.256
Husband	0	0	0.8	1.9	0.002
Doctor	65.5	66.6	68.7	66.6	0.725
Others	1.0	1.2	2.5	2.2	0.429
Parity ≥2					
Women request	31.8	31.1	35.0	31.4	0.279
Husband	0	0	2.1	1.0	0.001
Doctor	66.7	67.7	61.9	66.7	0.079
Others	1.6	1.2	1.0	0.9	0.743
Eastern					

Parity 1					
Women request	34.8	31.7	27.7	23.6	0.002
Husband	0	0	1.5	1.3	0.006
Doctor	63.9	67.2	69.5	72.8	0.045
Others	1.2	1.1	1.3	2.32	0.494
Parity ≥2					
Women request	37.2	30.5	36.3	33.0	0.316
Husband	0	0	1.1	1.1	0.156
Doctor	60.6	68.9	61.6	65.4	0.142
Others	2.3	0.6	1.1	0.5	0.158
Central					
Parity 1					
Women request	37.6	30.3	30.7	27.0	0.020
Husband	0	0	1.0	1.6	0.005
Doctor	62.0	68.4	67.1	70.9	0.072
Others	0.4	1.3	1.2	0.6	0.502
Parity ≥2					
Women request	30.9	33.2	31.4	33.4	0.912
Husband	0	0	2.1	1.8	0.008
Doctor	67.9	65.7	65.0	64.2	0.776
Others	1.2	1.1	1.6	0.6	0.487
Western					
Parity 1					
Women request	34.8	28.2	24.3	23.3	0.029
Husband	0	0	1.6	2.0	0.005
Doctor	64.1	71.4	72.7	74.2	0.103
Others	1.1	0.4	1.3	0.5	0.383
Parity ≥2					

Women request	26.0	24.7	29.9	24.9	0.302
Husband	0	0	2.2	0.7	0.012
Doctor	71.0	74.3	66.9	72.8	0.163
Others	3.0	1.0	1.0	1.6	0.515

Table S3 Factors associated with use of caesarean section (CS) in China by region, 2008-2018

	Eastern		Central		Western	
	CS rate (%)	Adjusted* OR (95%CI)	CS rate (%)	Adjusted* OR (95%CI)	CS rate (%)	Adjusted* OR (95%CI)
Year of the survey						
2013	43.5	1.00	49.7	1.00	31.7	1.00
2018	48.1	1.07 (0.97-1.18)	50.7	0.93 (0.84-1.04)	37.4	1.10 (1.00-1.22)
Age						
<25	36.5	1.00	43.2	1.00	26.4	1.00
25-34	44.5	1.36 (1.16-1.59)	49.7	1.27 (1.09-1.47)	34.4	1.30 (1.13-1.50)
⩾35	55.4	2.15 (1.78-2.59)	55.9	1.74 (1.45-2.09)	42.4	2.02 (1.69-2.41)
Educational level						
Illiterate or primary school	46.2	1.00	48.5	1.00	23.6	1.00
Secondary school	44.8	0.99 (0.83-1.19)	46.9	0.92 (0.78-1.09)	31.9	1.43 (1.24-1.64)
High school or higher	46.8	0.94 (0.78-1.14)	54.0	0.95 (0.79-1.14)	44.0	1.50 (1.27-1.76)
Residence						
Urban	47.4	1.00	55.5	1.00	45.0	1.00
Rural	44.2	0.95 (0.85-1.06)	44.5	0.78 (0.70-0.87)	25.4	0.56 (0.51-0.63)
Region						
Eastern	46.0	--	--	--	--	--
Central	--	--	50.2	--	--	--
Western	--	--	--	--	34.6	--
Health insurance coverage [a]						
URRBMI	44.6	1.00	47.8	1.00	31.8	1.00
UEBMI	48.5	1.01 (0.89-1.15)	57.5	1.07 (0.92-1.25)	49.2	0.96 (0.82-1.13)
None	43.6	0.88 (0.73-1.06)	56.7	1.24 (0.99-1.55)	37.2	0.91 (0.70-1.18)
Others	52.2	1.20 (0.93-1.55)	56.3	1.18 (0.87-1.60)	35.2	0.88 (0.65-1.19)
Income quartile						
Quartile 1	43.6	1.00	45.3	1.00	24.9	1.00
Quartile 2	44.9	1.04 (0.90-1.21)	49.6	1.16 (1.01-1.32)	35.5	1.38 (1.21-1.57)
Quartile 3	47.2	1.12 (0.97-1.28)	52.5	1.21 (1.07-1.38)	40.0	1.44 (1.25-1.65)
Quartile 4	47.0	1.06 (0.91-1.23)	54.9	1.19 (1.02-1.39)	47.3	1.60 (1.37-1.87)
Parity						
1	45.4	1.00	51.9	1.00	38.0	1.00
≥2	46.7	0.91 (0.81-1.01)	48.5	0.87 (0.78-0.97)	31.6	0.84 (0.75-0.94)
Place of delivery						
Township/community health center	32.0	1.00	34.4	1.00	16.4	1.00
County or higher level hospital	49.1	1.98 (1.71-2.30)	52.6	1.90 (1.61-2.24)	37.2	2.37 (1.95-2.87)

Maternal and child health hospital	44.2	1.62 (1.37-1.91)	51.9	1.77 (1.48-2.12)	34.5	2.02 (1.64-2.48)
Private hospital	55.8	2.57 (1.82-3.62)	52.7	1.97 (1.48-2.62)	40.9	2.82 (2.04-3.90)

* Adjusting for all explanatory variables

[a] URRBMI: Urban and Rural Residents Basic Medical Insurance

UEBMI: Urban Employee Basic Medical Insurance

Others include free medical service scheme for special sectors or labor insurance

Table S4 Factors associated with use of caesarean section (CS) after relaxation of the one child policy by urban and rural, 2016-2018

	Urban		Rural	
	Unadjusted	Adjusted*	Unadjusted	Adjusted*
	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)
Age				
<25	1.00	1.00	1.00	1.00
25-34	1.57 (1.25-1.98)	1.51 (1.19-1.92)	1.87 (1.53-2.28)	1.74 (1.40-2.17)
≥35	2.73 (2.12-3.51)	2.50 (1.90-3.29)	2.60 (2.02-3.35)	2.46 (1.84-3.28)
Educational level				
Illiterate or primary school	1.00	1.00	1.00	1.00
Secondary school	1.25 (0.90-1.74)	1.39 (0.99-1.94)	1.40 (1.13-1.73)	1.34 (1.07-1.67)
High school or higher	1.12 (0.82-1.53)	1.25 (0.90-1.75)	1.29 (1.04-1.61)	1.09 (0.85-1.40)
Residence				
Urban	--	--	--	--
Rural	--	--	--	--
Region				
Eastern	1.00	1.00	1.00	1.00
Central	1.13 (0.97-1.32)	1.08 (0.92-1.26)	0.86 (0.71-1.03)	0.89 (0.74-1.08)
Western	0.89 (0.77-1.03)	0.89 (0.77-1.04)	0.43 (0.36-0.52)	0.49 (0.41-0.59)
Health insurance coverage [a]				
URRBMI	1.00	1.00	1.00	1.00
UEBMI	1.03 (0.90-1.18)	0.98 (0.84-1.15)	1.29 (1.00-1.66)	0.96 (0.72-1.28)
None	0.76 (0.59-0.97)	0.78 (0.60-1.01)	1.25 (0.79-1.99)	1.14 (0.71-1.84)
Others	1.20 (0.91-1.59)	1.08 (0.81-1.45)	0.80 (0.53-1.23)	0.85 (0.54-1.31)
Income quartile				
Quartile 1	1.00	1.00	1.00	1.00
Quartile 2	1.06 (0.86-1.31)	1.03 (0.83-1.27)	1.24 (1.04-1.48)	1.11 (0.92-1.33)
Quartile 3	1.15 (0.95-1.40)	1.10 (0.89-1.35)	1.56 (1.29-1.89)	1.33 (1.08-1.64)
Quartile 4	1.00 (0.83-1.21)	0.95 (0.77-1.17)	1.41 (1.09-1.83)	1.20 (0.91-1.59)
Parity				
1	1.00	1.00	1.00	1.00
≥2	1.41 (1.25-1.60)	1.17 (1.02-1.34)	1.25 (1.07-1.46)	1.03 (0.86-1.23)
Place of delivery				

Township/community health center	1.00	1.00	1.00	1.00
County or higher level hospital	1.54 (1.12-2.12)	1.62 (1.17-2.25)	2.53 (1.83-3.51)	2.60 (1.86-3.63)
Maternal and child health hospital	1.30 (0.93-1.80)	1.37 (0.98-1.93)	1.85 (1.29-2.65)	1.84 (1.27-2.67)
Private hospital	1.72 (1.16-2.56)	1.84 (1.22-2.76)	2.48 (1.61-3.81)	2.62 (1.68-4.07)

* Adjusting for all explanatory variables

[a] URRBMI: Urban and Rural Residents Basic Medical Insurance

UEBMI: Urban Employee Basic Medical Insurance

Others include free medical service scheme for special sectors or labor insurance

Table S5 Factors associated with use of C-section after relaxation of the one child policy across regions, 2016-2018

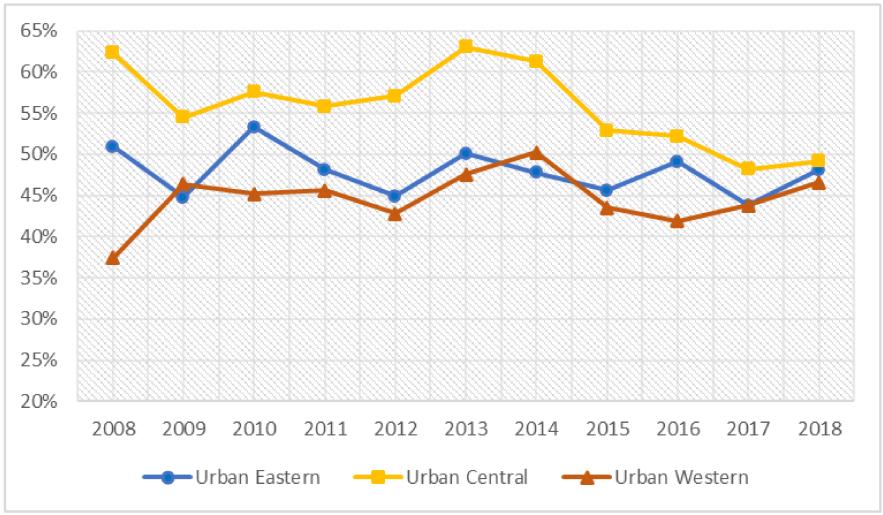
	Eastern		Central		Western	
	Unadjusted OR (95%CI)	Adjusted OR (95%CI)	Unadjusted OR (95%CI)	Adjusted OR (95%CI)	Unadjusted OR (95%CI)	Adjusted OR (95%CI)
Age						
<25	1.00	1.00	1.00	1.00	1.00	1.00
25-34	1.62 (1.22-2.16)	1.58 (1.17-2.14)	1.96 (1.47-2.60)	1.77 (1.31-2.39)	1.60 (1.27-2.00)	1.48 (1.16-1.88)
≥35	2.88 (2.11-3.95)	2.76 (1.94-3.91)	3.03 (2.18-4.21)	2.49 (1.72-3.61)	2.37 (1.80-3.11)	2.20 (1.60-3.01)
Educational level						
Illiterate or primary school	1.00	1.00	1.00	1.00	1.00	1.00
Secondary school	1.05 (0.74-1.49)	1.20 (0.84-1.72)	0.92 (0.65-1.31)	1.04 (0.72-1.51)	1.67 (1.28-2.19)	1.62 (1.22-2.14)
High school or higher	0.79 (0.57-1.10)	0.98 (0.68-1.41)	0.91 (0.65-1.28)	0.90 (0.61-1.32)	2.04 (1.57-2.64)	1.51 (1.12-2.05)
Residence						
Urban	1.00	1.00	1.00	1.00	1.00	1.00
Rural	1.11 (0.95-1.30)	0.98 (0.81-1.17)	0.84 (0.70-1.01)	0.91 (0.73-1.13)	0.54 (0.46-0.64)	0.69 (0.57-0.84)
Region						
Eastern	--	--	--	--	--	--
Central	--	--	--	--	--	--
Western	--	--	--	--	--	--
Health insurance coverage						
URRBMI	1.00	1.00	1.00	1.00	1.00	1.00
UEBMI	0.85 (0.72-1.00)	0.92 (0.75-1.14)	1.26 (1.01-1.56)	1.12 (0.86-1.44)	1.50 (1.22-1.83)	0.95 (0.74-1.22)
None	0.62 (0.47-0.82)	0.65 (0.48-0.88)	1.23 (0.75-2.01)	1.36 (0.82-2.27)	1.24 (0.76-2.02)	1.05 (0.64-1.73)
Others	1.10 (0.77-1.58)	1.15 (0.79-1.69)	1.23 (0.81-1.85)	1.03 (0.67-1.57)	0.84 (0.53-1.32)	0.77 (0.48-1.24)
Income quintiles						
Quintile 1	1.00	1.00	1.00	1.00	1.00	1.00
Quintile 2	0.90 (0.70-1.14)	0.97 (0.79-1.21)	0.93 (0.73-1.19)	0.94 (0.73-1.21)	1.62 (1.31-2.01)	1.37 (1.09-1.71)
Quintile 3	0.93 (0.74-1.17)	0.85 (0.68-1.06)	1.16 (0.91-1.48)	1.12 (0.87-1.45)	2.00 (1.60-2.50)	1.54 (1.21-1.98)
Quintile 4	0.77 (0.62-0.96)	1.16 (0.97-1.38)	1.09 (0.84-1.41)	1.01 (0.75-1.36)	1.93 (1.53-2.42)	1.33 (1.01-1.75)
Parity						
1	1.00	1.00	1.00	1.00	1.00	1.00
≥2	1.47	2.26	1.50	1.28	0.98	0.99

	(1.26-1.72)	(1.63-3.14)	(1.25-1.81)	(1.04-1.57)	(0.84-1.16)	(0.82-1.20)
Place of delivery						
Township/community health center (ref.)						
County or higher level hospital	2.08 (1.52-2.85)	1.66 (1.16-2.36)	1.71 (1.06-2.74)	1.79 (1.11-2.90)	2.51 (1.58-3.97)	2.06 (1.28-3.29)
Maternal and child health hospital	1.55 (1.10-2.18)	2.64 (1.61-4.31)	1.55 (0.95-2.54)	1.61 (0.96-2.67)	2.19 (1.36-3.53)	1.70 (1.04-2.78)
Private hospital	2.49 (1.54-4.03)	2.55 (1.79-3.64)	1.26 (0.73-2.18)	1.36 (0.78-2.37)	3.78 (2.17-6.58)	3.25 (1.84-5.74)

* Adjusting for all explanatory variables

Figure S1 Proportion of women giving birth by caesarean section across regions by urban and rural, 2008-2018

a. Caesarean section rate in urban areas across regions



b. Caesarean section rate in rural areas across regions

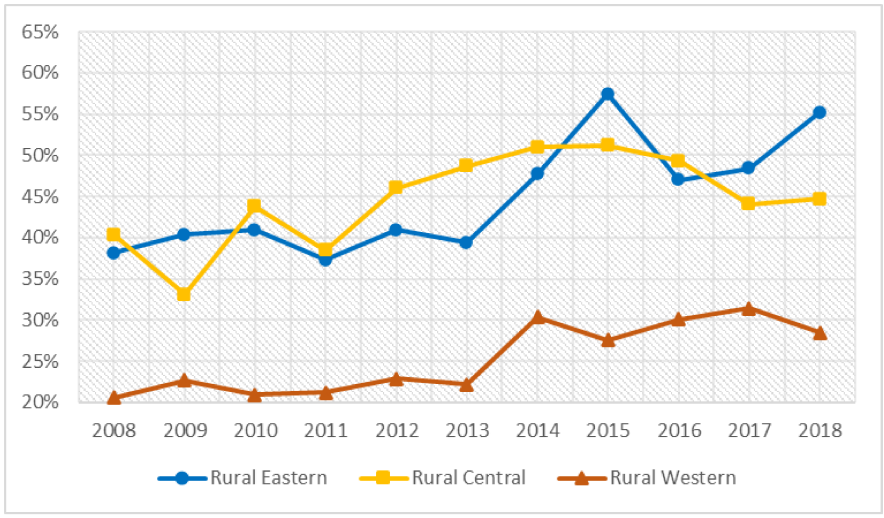
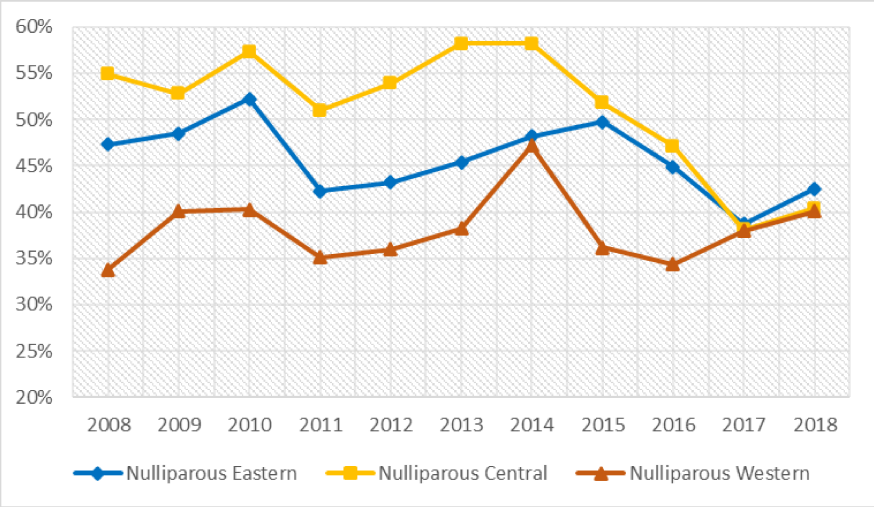
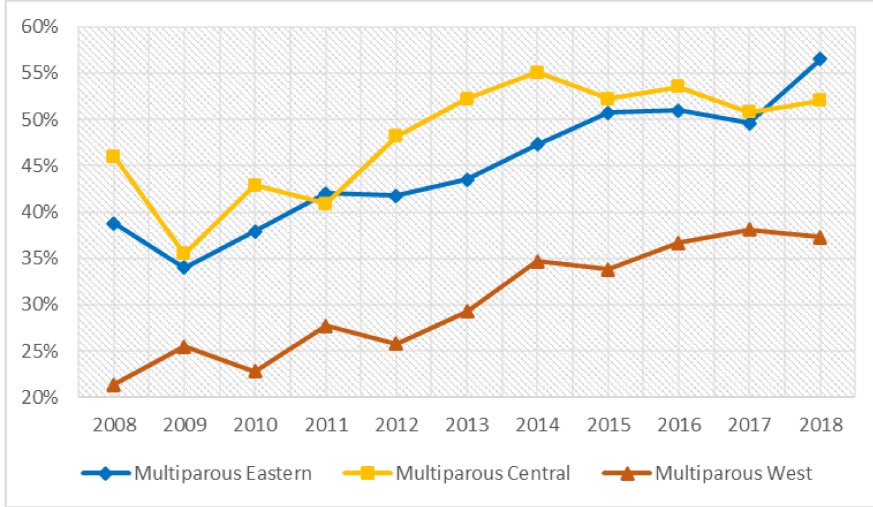


Figure S2 Proportion of women giving birth by caesarean section by parity across regions, 2008-2018

a. Caesarean section rate among nulliparous women across regions



b. Caesarean section rate among multiparous women across regions