

Multilevel Analysis of Current Fertility in Cambodia*

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Introduction

- Cambodia needs a viable population policy to curb fertility (Minister of Interior 1999, 2003)
- Fertility in Cambodia remains high:
 - TFR of 5.3 in 1993-98 and 4.0 in 2000
 - High marital fertility due to the increase in the number of susceptible women following the conception dearth during the Khmer Rouge crisis (Heuveline 2003)
 - Unmet need
- Fertility decline is rather pausable in the emerging development programs in the 1990s, especially in the education and non-agricultural sectors

Research Questions

- Does social change during the 1990s have impact on fertility behavior?
- Is fertility decline partly due to decreasing children's economic contribution to the family?
- To what extent do individual characteristics explain the variation in fertility behavior?

Contextual Factors

- Demographic Transition
 - Socioeconomic development → fertility decline
- Spread of Mass education (Caldwell 1980):
 - Mass education → school attendance of children
 - School attendance → reducing economic roles of children and increasing parental investments in children
- Education and participation in the modern sector influence change in the traditional values and norms, including high fertility (Hirschman and Guest 1990)
- Other development factors: low IMR and delaying marriage

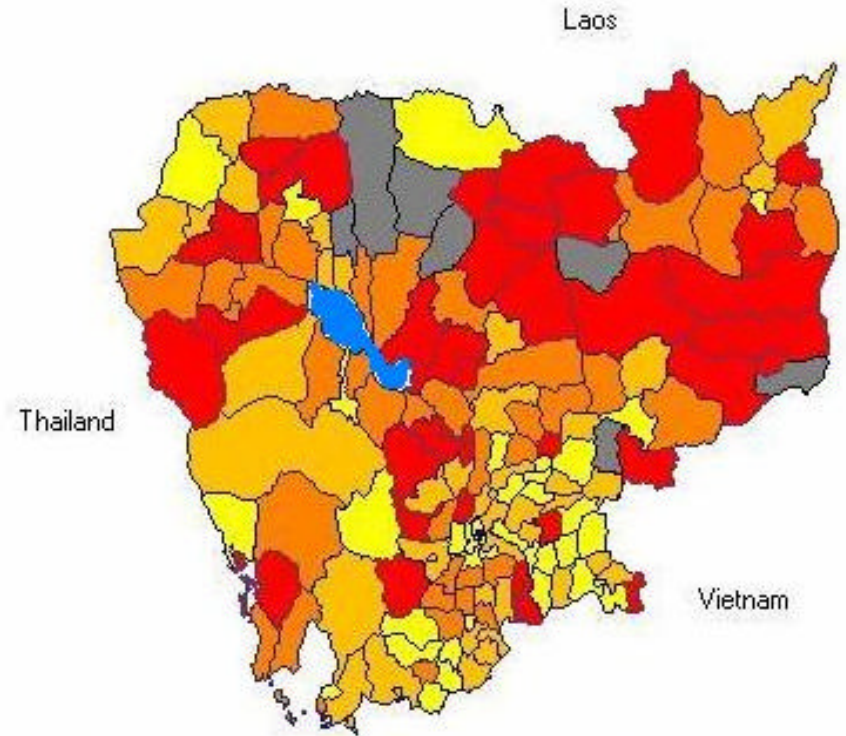
Individual Factors

- Women's own education → fertility behavior:
 - Different ideas about family life and childbearing (Cleland 1985)
 - Sense of autonomy and access to resources (Jejeebhoy 1995)
 - Exposed to the Western culture
- Women with non-agricultural occupations or married to non-agriculturalists tend to have lower fertility than do their counterparts:
 - Opportunity costs
 - Higher social class

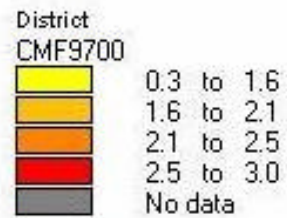
Data and Method

- Contextual Data: 1998 Cambodia Census
- Individual Data: 2000 Cambodia DHS
- Analytical Sample: Currently married women age 15-44
- Method: OLS regressions for women age 15-29 and age 30-44

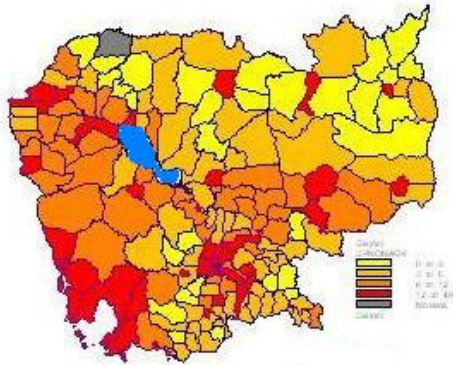
- Current fertility is measured as the number of children age 0-3 at the survey (a proxy for 1997-2000 fertility) divided by 4 for annual estimate and multiplied by 15 for the age range.



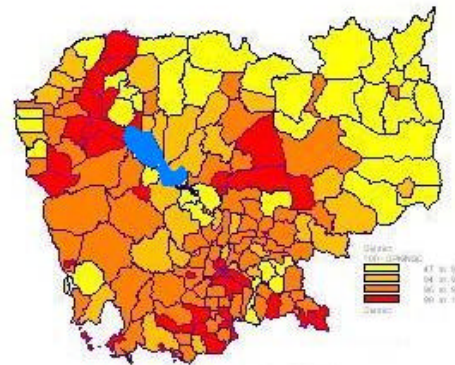
Current Marital Fertility of Women Age 15-44
(DHS 2000)



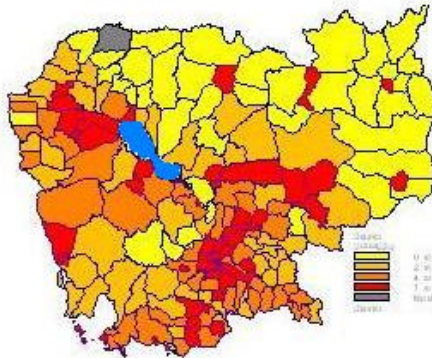
Average Levels of Development for Cambodia: 1998 Census



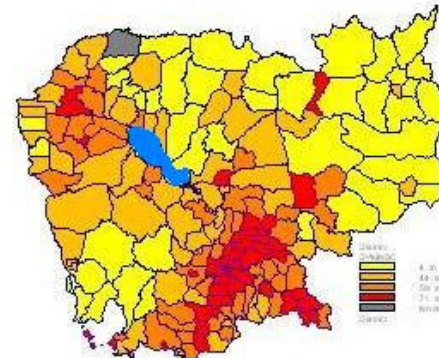
% women 15-34 in nonagricultural sector



% children 10-14 not employed



% women 15-34 with primary education



% children 7-14 enrolled in school

Figure 1: Age-Specific Marital Fertility by Age of Mother

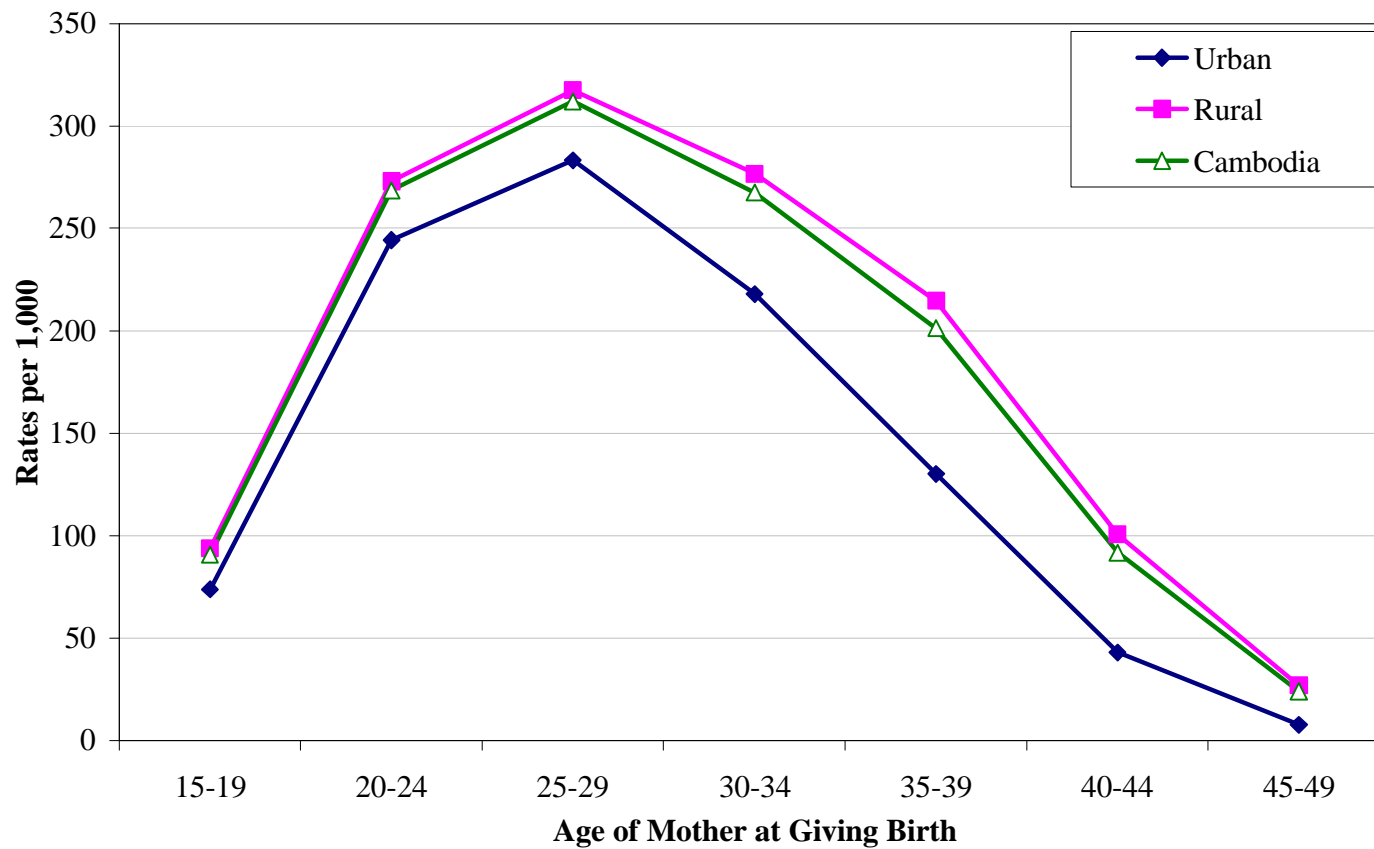
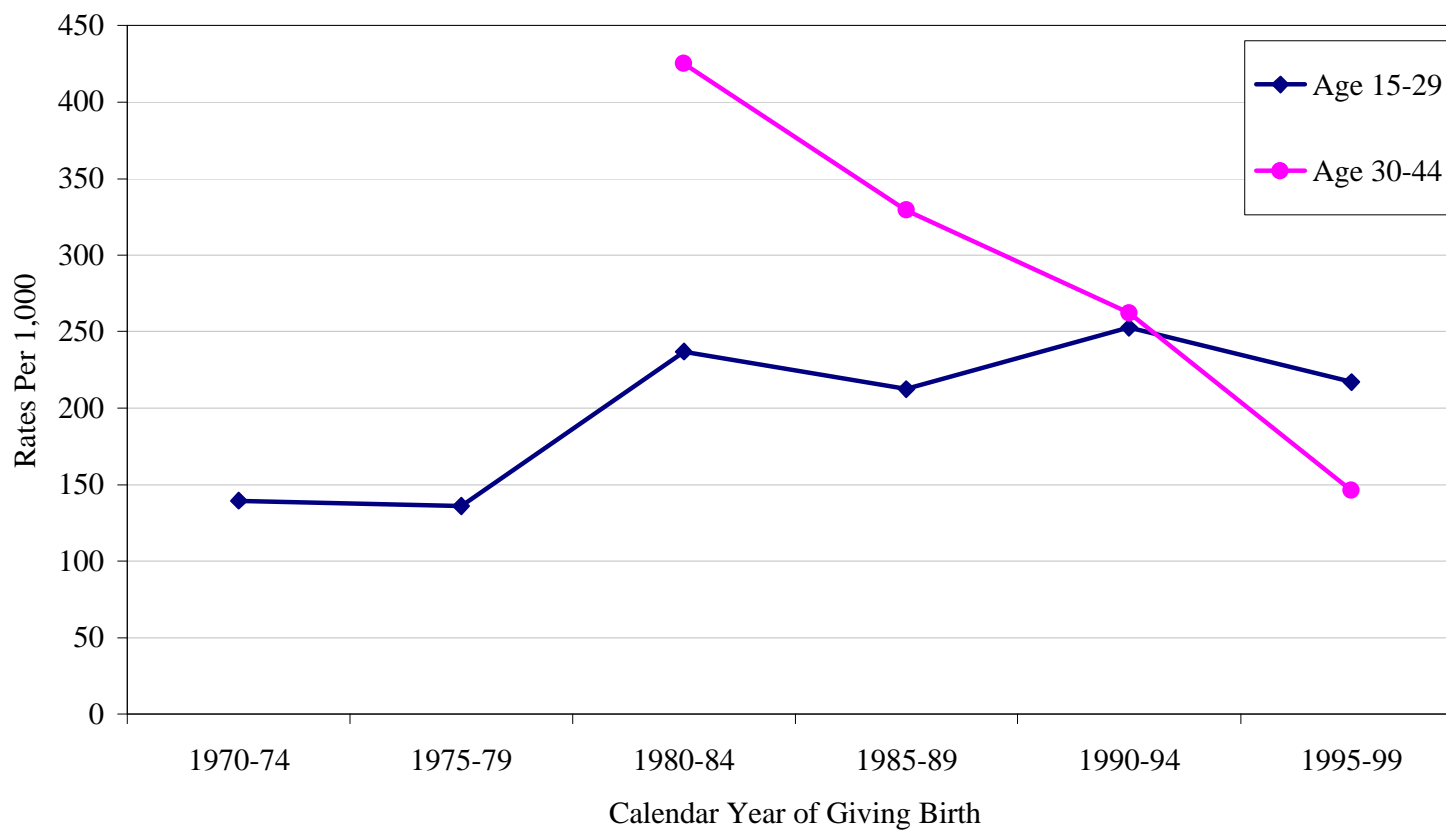


Figure 2: Period-Specific Marital Fertility by Calendar Year and by Women's Age Group



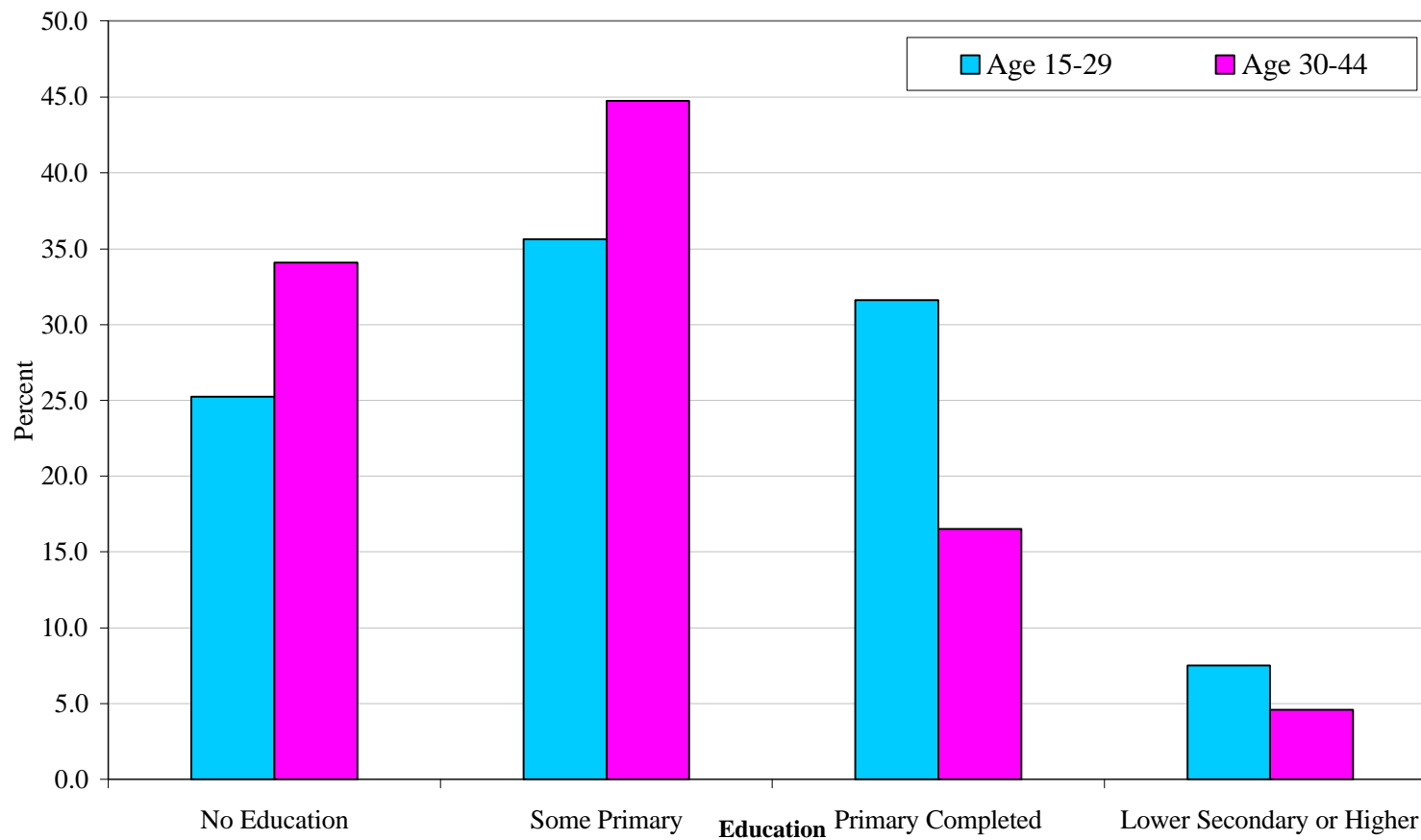
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No evidence of declining marital fertility among married women age 15-29.

Table 1
Current Fertility and Contextual Characteristics (Means)

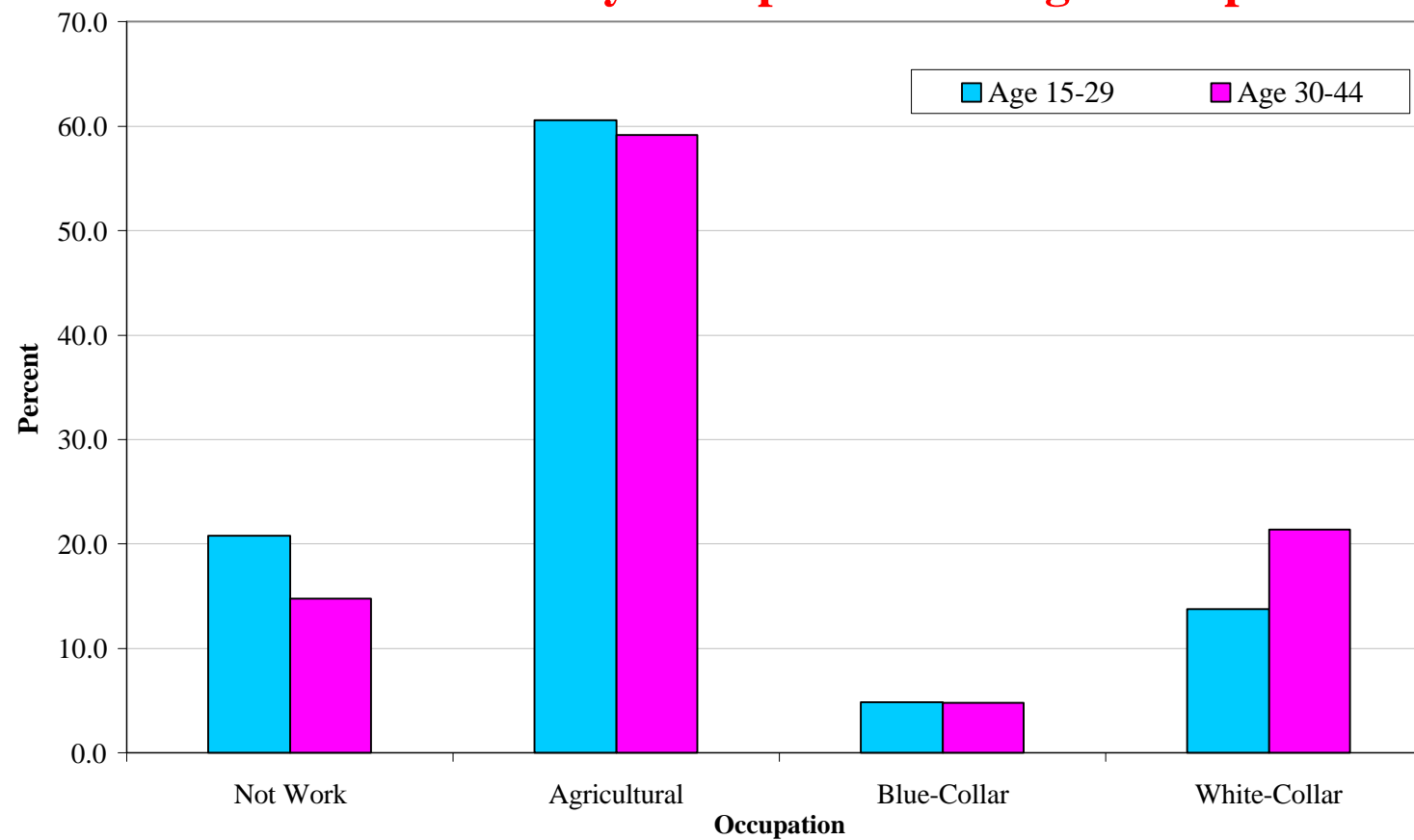
	<u>Age 15-29</u>	<u>Age 30-44</u>	<u>Age 15-44</u>
Current Fertility	2.5	1.6	1.9
Status of Women			
% Women Aged 15-34 in Non-Agricultural Sector	10.7	12.0	11.5
% Women Aged 15-34 with Primary Education	7.5	8.1	7.9
Economic Roles of Children			
% Children Aged 7-14 Enrolled in School	63.4	64.6	64.1
% Children Aged 10-14 Not Employed	95.6	96.0	95.9
% of Women Aged 15-24 Single	68.9	70.0	69.5
Average 1991-95 Infant Mortality per 100 Births	9.1	8.9	9.0
Number of Women (weighted)	2,962	4,822	7,784

Figure 3: Percent Distribution of Married Women by Educational Level and Age Group



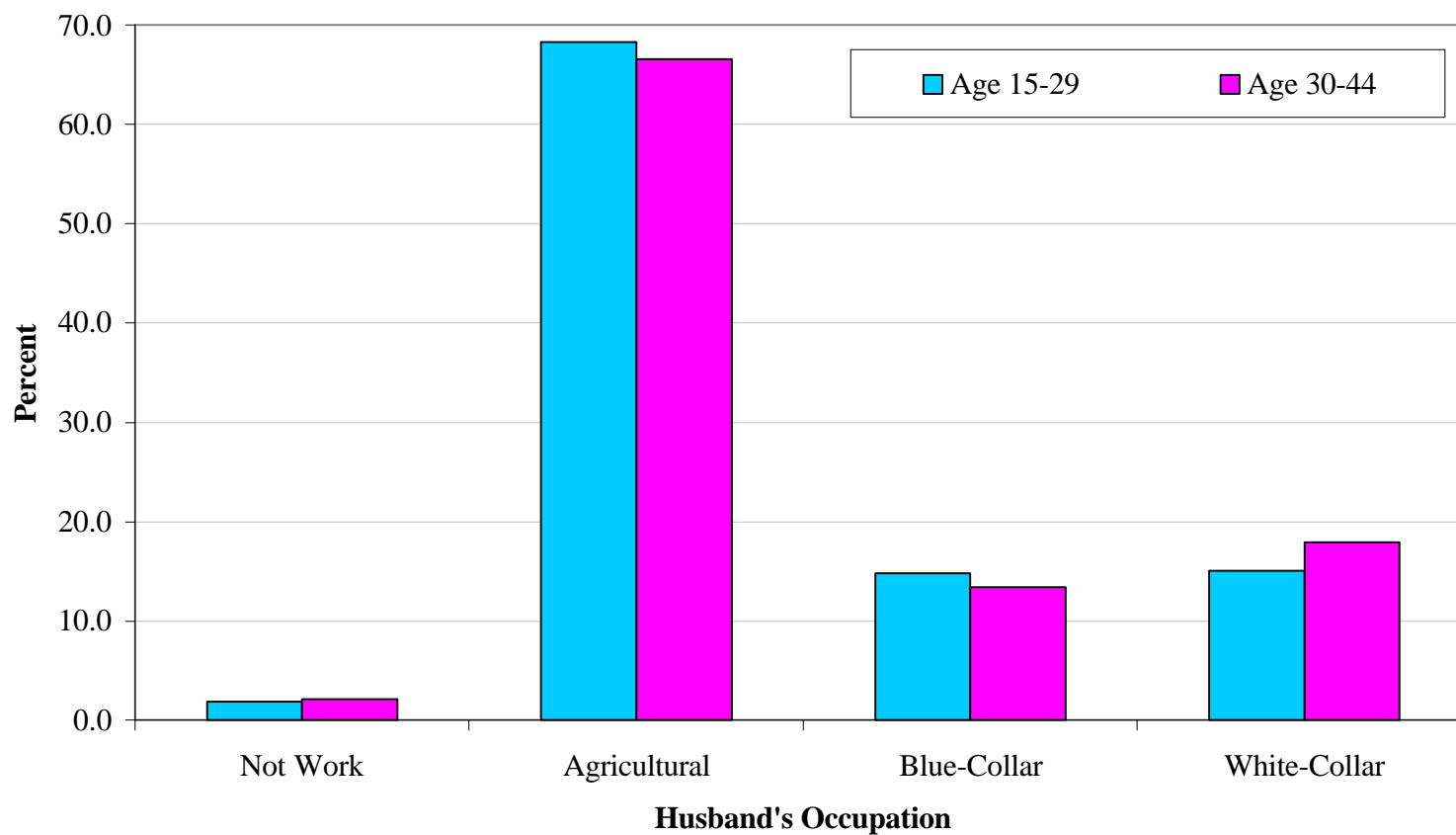
The % of women with primary education was higher for younger than for older women.

Figure 4: Percent Distribution of Currently Married Women by Occupation and Age Group



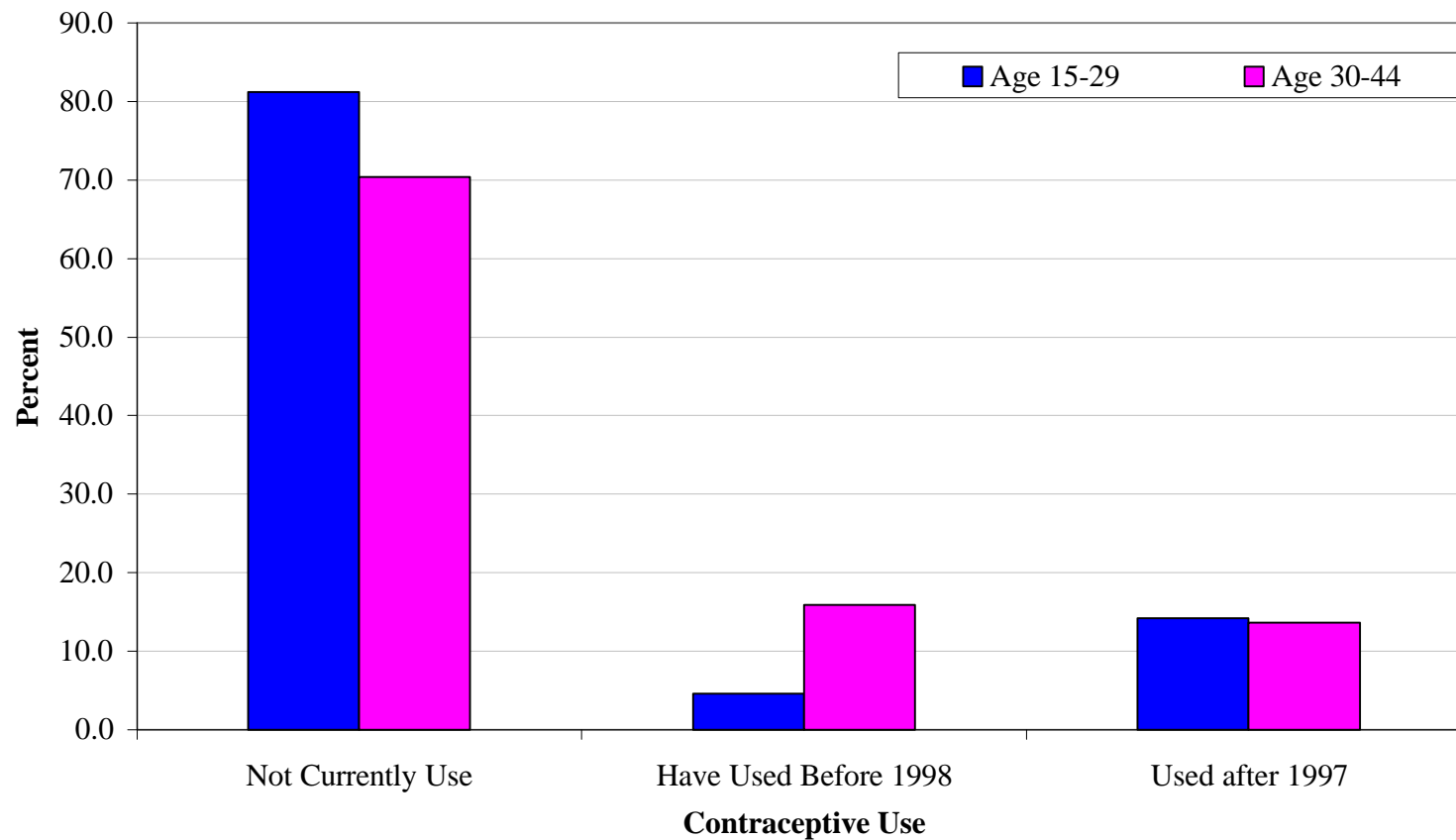
The majority of women worked in the agricultural sector.

Figure 5. Percent Distribution of Married Women by Husbands' Occupation and Age Group



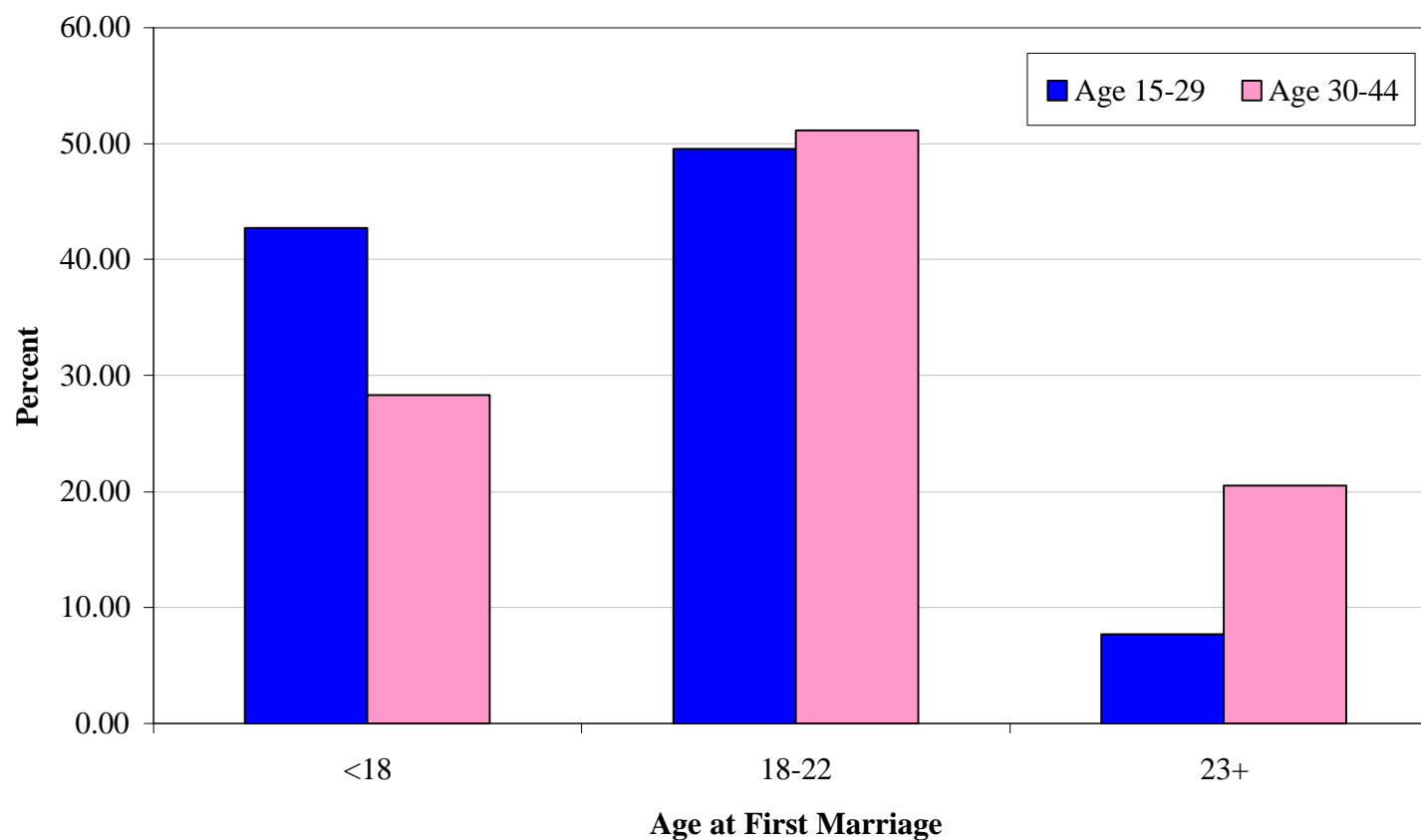
The majority of husbands worked in the agricultural sector.

Figure 6: Percent Distribution of Married Women by Contraceptive Use and Age Group



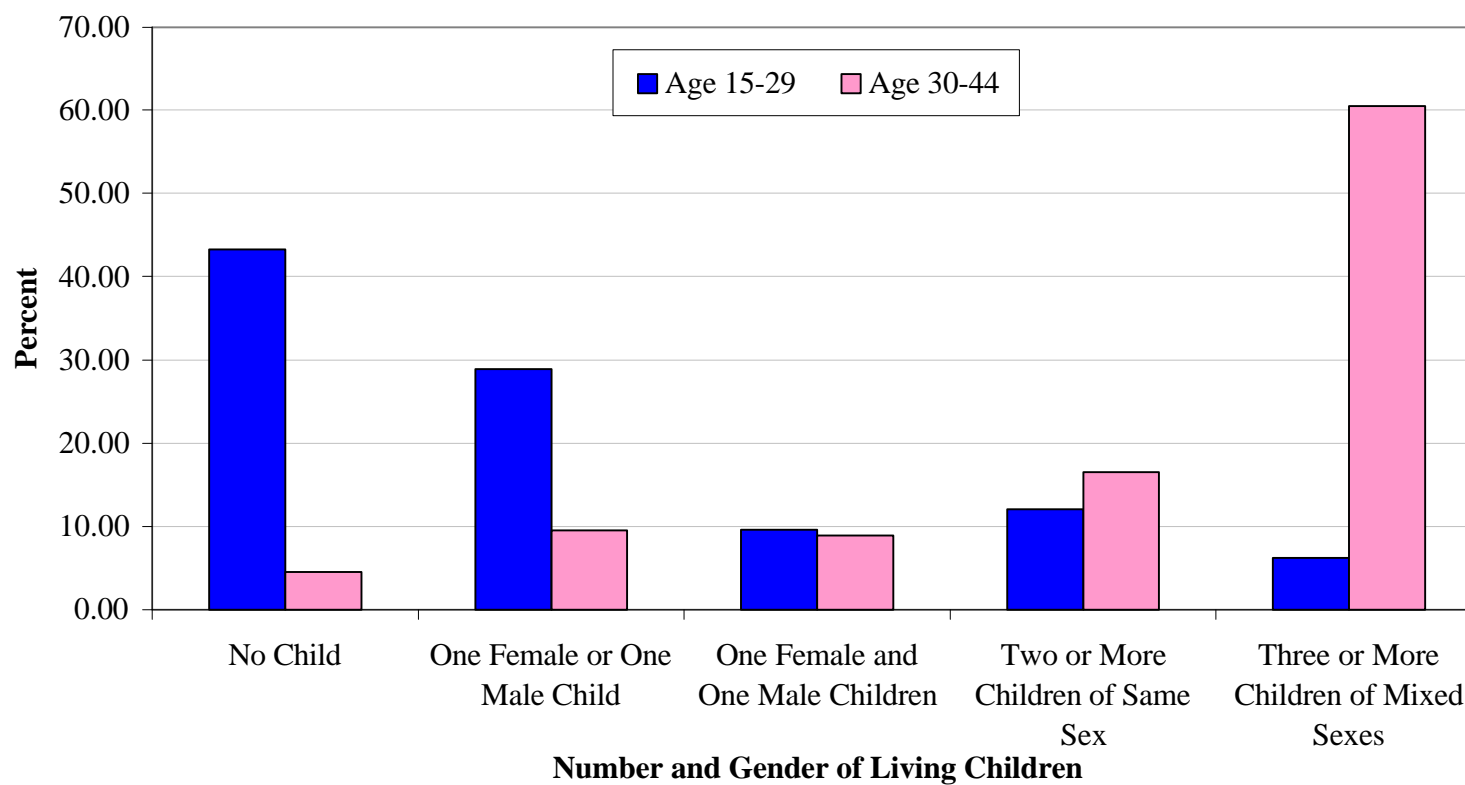
The majority of women have never used any contraceptive method.

**Figure 7. Percent Distribution of Married Women
by Age at First Marriage and Age Group**



The percent of women married at older is higher among older women than among younger women due to the KR period effect.
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Figure 8. Percent Distribution of Married Women by Number and Gender of Living Children in 1997 and by Age Group



Older women have more children than do younger women.

Table 2
Correlations Among Contextual Factors and Current Fertility (CF)

	<u>CF</u>	<u>WNAGR</u>	<u>WPRIMED</u>	<u>KINSCH</u>	<u>KNOTEMP</u>	<u>WSINGL</u>
% Women (15-34) in Non-Agricultural Sector (WNAGR)	-0.08 *					
% Women (15-34) with Primary Education (WPRIMED)	-0.10 *	0.81 *				
% Children (7-14) Enrolled in School (KINSCH)	-0.11 *	0.40 *	0.63 *			
% Children (10-14) Not Employed (KNOTEMP)	-0.06 *	0.28 *	0.34 *	0.65 *		
% of Women (15-24) Single (WSINGL)	-0.05 *	0.48 *	0.58 *	0.69 *	0.55 *	
1991-95 Infant Mortality	0.05 *	-0.31 *	-0.32 *	-0.38 *	-0.47 *	-0.37 *

* P < .001

Table 3
Factor Analysis of Contextual Variables: Varimax Rotation^a

	<u>Factor Loadings</u>				<u>Cum. %</u>	<u>Alpha</u>
	<u>WNAGR</u>	<u>WPRIM</u>	<u>KINSCH</u>	<u>KNOTEMP</u>		
Factor 1: Status of Women	0.94	0.92	0.44	0.10	65.31	0.89
Factor 2: Economic Roles of Children	0.13	0.28	0.79	0.93	88.40	0.54

^a % of women single was excluded from the factor analysis due to cross-loadings

Table 4
Means of Current Fertility by Selected Characteristics

	<u>Age 15-29</u>	<u>Age 30-44</u>
Education		
No Education	2.63	1.77
Some Primary	2.55	1.55
Primary Education	2.43	1.44
Lower Secondary or Higher	1.87	1.18
Occupation		
Not Work	2.73	1.75
Agricultural	2.53	1.73
Blue-Collar	2.05	1.28
White-Collar	2.09	1.15
Husband's Occupation		
Not Work	3.29	1.41
Agricultural	2.51	1.77
Blue-Collar	2.72	1.48
White-Collar	2.05	1.00
<u>Control Factors</u>		
Age at First Marriage		
<18	2.48	1.41
18-22	2.48	1.50
23+	2.56	2.05
Parity in 1997 by Gender of Children		
No Child	2.38	1.83
One Male or One Female	2.83	2.03
One Male and One Female	2.22	1.67
Two or More of One Sex	2.43	1.81
Three or More of Mixed Sexes	2.12	1.43
Contraceptive Use		
Not Use	2.47	1.77
Have Used Before 1998	1.15	0.42
Started after 1997	2.97	2.03

Table 5
Unstand. Reg. Coefficients of Current Fertility

	Age 15-29				
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	0.65	0.28	2.58	2.24	0.17
Status of Women	-0.23 ***	-0.24 ***			-0.20 **
Children's Economic Roles	-0.13 *	-0.15 *			-0.13 *
1991-95 Infant Mortality	0.01	0.01			0.01
% Women Aged 15-24, Single	0.02 *	0.02 *			0.03 **
Individual Characteristics					
Education (No Education)					
Some Primary			-0.07	-0.15	-0.13
Primary Education			-0.16	-0.21	-0.18
Lower Secondary or Higher			-0.55 *	-0.69 **	-0.53 *
Occupation (Agricultural)					
Not Work			0.21	0.21	0.26 *
Blue-Collar			-0.49 *	-0.45	-0.40
White-Collar			-0.32 *	-0.27	-0.22
Husband's Occupation (Agricultural)					
Not Work			0.84 *	0.78 *	0.81 *
Blue-Collar			0.35 *	0.35 *	0.42 **
White-Collar			-0.18	-0.17	-0.08
Age at First Marriage					
18-22		-0.04		0.02	0.01
23+		0.10		0.18	0.14
Parity in 1997 (3 or More of Mixed Sexes)					
No Child		0.26		0.21	0.24
One Male or One Female		0.76 ***		0.72 **	0.75 ***
One Male and One Female		0.17		0.15	0.17
Two or More of One Sex		0.37		0.32	0.34
Contraceptive Use (Not Currently Use)					
Have Used Before 1998		-1.25 ***		-1.25 ***	-1.22 ***
Started after 1997		0.55 ***		0.55 ***	0.56 ***
R-Squared (%)	0.88	4.24	1.97	5.26	5.78
F	5.37	10.81	5.05	9.49	8.45
DF	4	12	9	17	21

*** p < .001; ** p < .01; * p < .05

Table 6 (Gender of Children is considered)
Unstand. Reg. Coefficients of Current Fertility

	Age 30-44				
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-0.27	-0.27	1.87	1.67	-0.28
Status of Women	-0.32 ***	-0.26 ***			-0.19 ***
Children's Economic Roles	-0.29 ***	-0.24 ***			-0.24 ***
1991-95 Infant Mortality	0.01	0.01			0.01
% Women Aged 15-24, Single	0.03 ***	0.02 **			0.03 ***
Individual Characteristics					
Education (No Education)					
Some Primary			-0.16	-0.10	-0.08
Primary Education			-0.06	-0.06	0.01
Lower Secondary or Higher			-0.09	-0.10	0.02
Occupation (Agricultural)					
Not Work			0.14	0.13	0.18
Blue-Collar			-0.28	-0.24	-0.25
White-Collar			-0.30 **	-0.18	-0.14
Husband's Occupation (Agricultural)					
Not Work			-0.29	-0.25	-0.17
Blue-Collar			-0.19	-0.14	-0.05
White-Collar			-0.63 ***	-0.56 ***	-0.47 ***
Age at First Marriage					
18-22		0.08		0.11	0.09
23+		0.50 ***		0.53 ***	0.51 ***
Parity in 1997 (3 or More of Mixed Sexes)					
No Child		-0.04		-0.01	0.01
One Male or One Female		0.34 *		0.33 *	0.34 *
One Male and One Female		0.19		0.21	0.22
Two or More of One Sex		0.33 **		0.34 ***	0.35 ***
Contraceptive Use (Not Currently Use)					
Have Used Before 1998		-1.15 ***		-1.14 ***	-1.09 ***
Started after 1997		0.32 **		0.32 **	0.33 **
R-Squared (%)	2.25	8.38	2.40	8.49	9.24
F	30.29	54.68	12.89	36.07	33.51
DF	4	12	9	17	21

*** p < 001; ** p < .01; * p < .05

Conclusions

- Fertility is responsive to development indicators
 - Status of women and economic roles of children have significant impact on lowering marital fertility at both the early and late stages of childbearing
 - The effect of economic roles of children is stronger on late fertility than on early fertility because the latter involves the marginal utility of an extra child
 - Change in infant mortality is not important in the process of fertility decline
- Lowering marital fertility at the early stage of childbearing
 - At least a lower secondary degree is needed
 - Being employed, especially in the modern sector
 - Need for family planning

- Childbearing at the late stage is more responsive to the development indicators than to women's own education and occupation
 - The non-significant effect of education for older women supports Caldwell's argument of the importance of the breadth, rather than the depth, of education
 - Need for family planning
 - Desire for mixed sexes children
- Implications
 - Socioeconomic development is substantial for fertility transition in Cambodia.
 - Family planning and population policy makers should consider developmental factors beyond and above socio-economic characteristics of husbands and wives.
 - Expanding mass education and occupations in the nonagricultural sector, as well as women's access to family planning, are of priority if early marital fertility to be lowered.