

# Public Preschool and Maternal Labor Supply in Algeria: Evidence from a Natural Experiment

Caroline Krafft (St. Catherine University, USA) and Moundir LASSASSI (CREAD, Algeria)

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- Motivation
- Background on pre-primary and the labor market in Algeria
- Data sources
- Identification strategy
- Results
- Implication for policy

- Female labor force participation is at the center of policy discussions around the world and in particular in the MENA region.
- Despite rapidly rising female educational attainment, female labor force participation rates in MENA region remain low and stagnant, the lowest in the world (Global Gender Gap Index 2019).
- A rich literature examines the determinants of FLFP in MENA countries. However, little is known about what programs or policies might increase FLFP in the MENA region.
- In particular, there is limited empirical evidence on the effects of child care access/costs, an important component of women's opportunity costs, for women in the MENA region.

## Theories explaining low FLFP

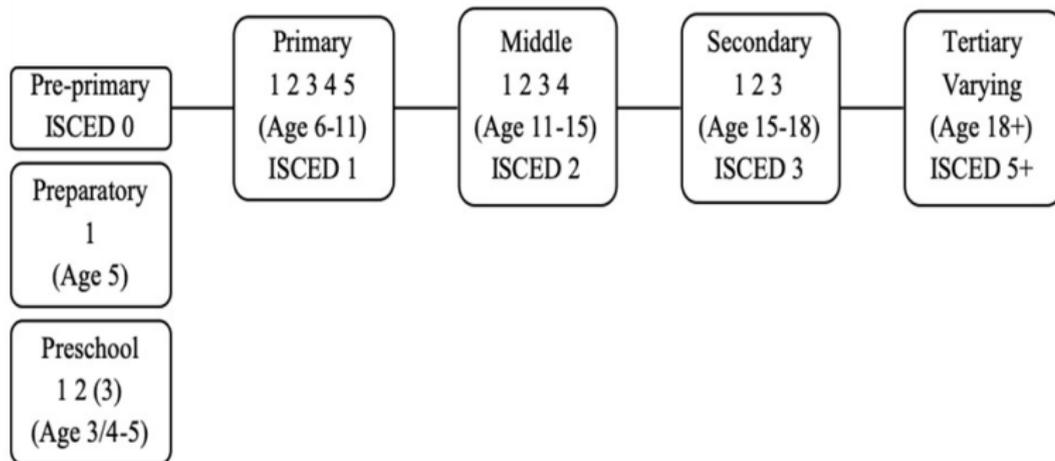
- High opportunity cost of time for women.
- Low labor demand either overall or for female-intensive sectors.
- Restrictive social norms.

## Main question

- What will it take to increase women's participation?
- We test the potential of public pre-primary to reduce the opportunity cost of women's time (given their domestic responsibilities) and increase their participation using a natural experiment in Algeria.

- Public provision of pre-primary has mixed results on FLFP. Some studies have found no or little effect from expanding pre-primary, or only impacts on specific sub-groups, e.g. single mothers (Cascio, 2009; Fitzpatrick, 2010, 2012; Havnes & Mogstad, 2011). Other studies do find significant effects (Baker, Gruber, & Milligan, 2008; Gelbach, 2002)
- In developing countries, the evidence on the impact of pre-primary on FLFP is also mixed. Most of the evidence is from Latin America and shows both positive and no impacts of pre-primary on FLFP (Angeles et al., 2012; Attanasio, Carneiro, & Olinto, 2017; Berlinski, Galiani, & McEwan, 2011).
- There are two studies to date in Africa, finding positive employment effects of subsidized care in Mozambique and Kenya (Clark, Kabiru, Laszlo, & Muthuri, 2019; Martinez, Naudeau, & Pereira, 2012).

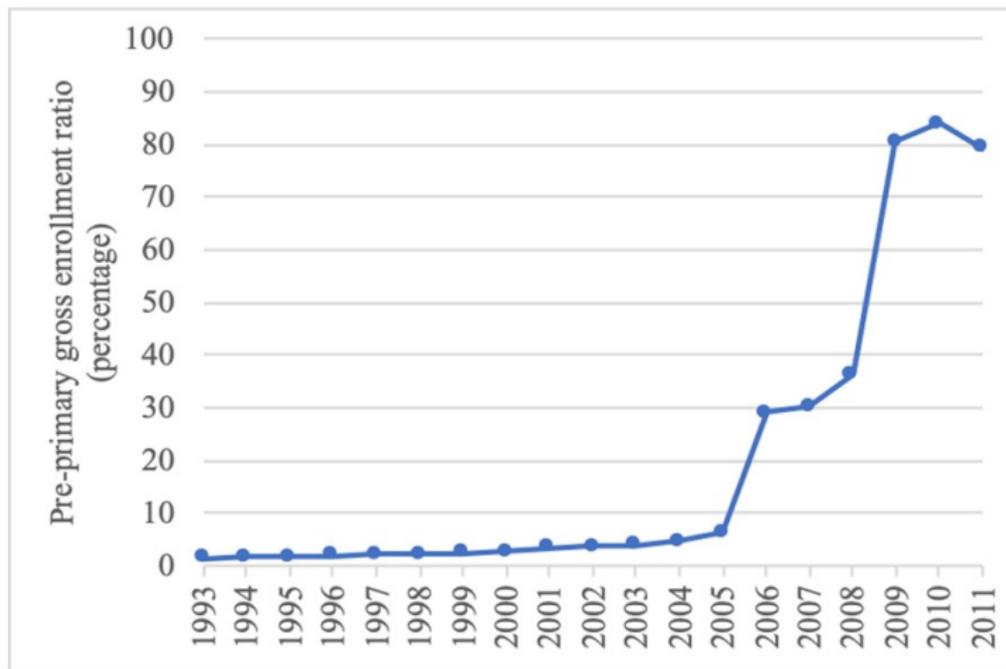
- Algeria is one of the many MENA countries with low FLFP, estimated at 16.6% (ONS, 2018).
- Algeria had the fourth-largest (of 146 countries) increase in years of schooling from 1980-2010 (Campante & Chor, 2012). Recent cohorts have achieved gender parity in education (Assaad, Hendy, Lassassi, & Yassin, 2018).
- Despite increases in women's education, FLFP has only increased very slightly over time, from 10.2% in 1990 to 16.6% in 2018 (ONS, 2018).
- Public sector employment played a key role in Algerian women's economic participation.
- Participation is higher for unmarried than married women (Assaad, Hendy, Lassassi, & Yassin, 2018). This suggests that domestic responsibilities, such as child care, that come with marriage and family formation, are a key constraint on FLFP.



Source: Authors' construction based on UNESCO Institute for Statistics (2014)

## Background

Algeria's pre-primary gross enrollment ratio (percentage), 1993-2011



Source: Authors' construction based on World Bank EdStats (World Bank, 2019)

## Surveys

- Algeria Multiple Indicator Cluster Surveys (MICS) conducted in 2006 and 2012 by UNICEF.
- In 2006, 29,008 households, 43,642 women, and 15,000 children under the age of five were interviewed.
- In 2012, 27,198 households, 38,548 women, and 14,701 children under the age of five were interviewed.

## Outcome measures

- We primarily focus on the impact of pre-primary on female labor force participation.
- Particularly for women with young children, whose children may have just started school.

## Covariates

- Location of the household: urban vs. rural residence and the region.
- Wealth quintile of the household.
- For children, we include information on children's age, mother's education, father's education, and children's sex.
- For women, we include information on their education, age group, and marital status.
- We also quantify the presence of children of various ages: 0-2, 3-5, 6-11, 12-17, by sex.

## Regression Discontinuity Design (RDD)

- We use an RDD strategy and exploit policies that set a cutoff date (age as of September 7) for pre-primary eligibility to identify the effect of pre-primary on FLFP, comparing 2006 and 2012.
- RDD models can be estimated parametrically or non-parametrically; we do both, with the more flexible functional form based on kernel-weighted local linear regressions.
- We use the typical fuzzy RDD estimator of the treatment effect, namely the ratio of the jump in the outcome to the jump in the probability of treatment (pre-primary).

- Weeks from the age cutoff at September 7 is our forcing variable (floor of  $(\text{September 7} - \text{birth date})/7$ ).
- If the birth date is September 7 or earlier, this value is zero or positive, and the child can enter pre-primary sooner. If the birth date is later in the year than September 7, this value is negative, and the child has to wait until the next school year to enter pre-primary.
- Since children can enter pre-primary at various ages, we divide our sample into discontinuity groups, based on the age on September 7. Specifically, we use six months older or younger than would turn age three on September 7, and likewise for ages four and five.

- We thus have three groups, the age three group (2.5-3.5 years old on September 7), the age four group (3.5-4.5 years old on September 7) and the age five group (4.5-5.5 years old on September 7).
- For women, we operationalize these same concepts based on the youngest eligible child. Children and women thus fall into one (and only one) discontinuity group and are near equally distributed on each side of the discontinuity.

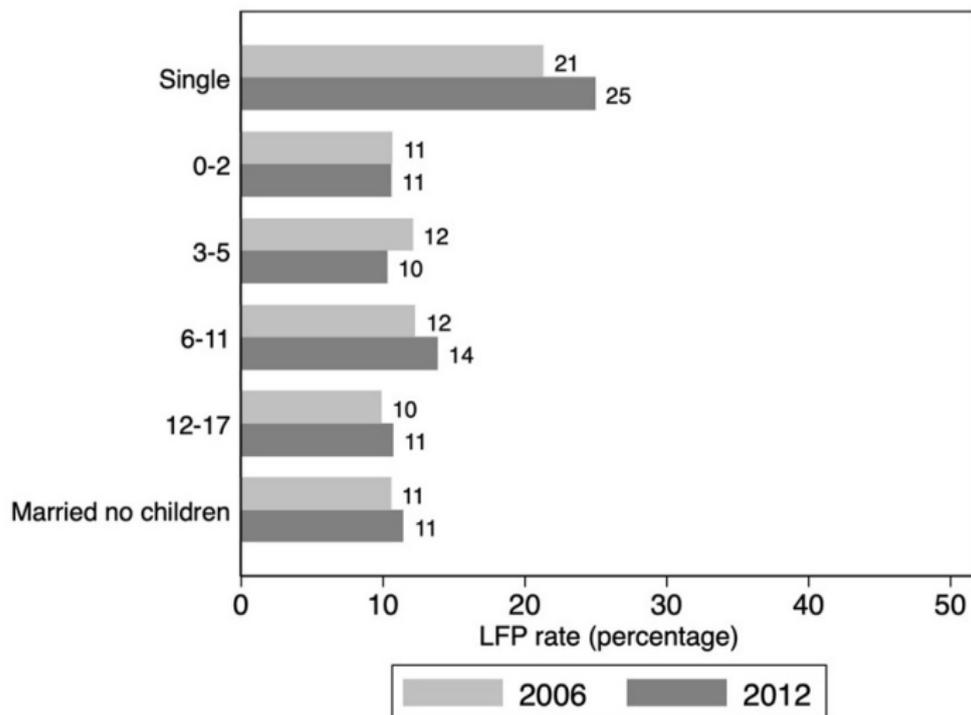
# Results - Descriptive analysis

## Women's labor market outcomes by characteristic (percentage), 2006 and 2012

	<u>2006</u>			<u>2012</u>		
	LFP rate	Emp. rate	Unemp. rate	LFP rate	Emp. rate	Unemp. rate
<b>Youngest child in pre-primary (women with ECE eligible children)</b>						
No	9	8	11	7	6	13
Yes	21	20	6	16	14	9
<b>Education level</b>						
None	7	5	23	5	3	34
Primary	11	7	36	9	6	35
Middle	16	9	42	14	8	41
Secondary	23	16	27	19	15	20
Tertiary	41	30	27	46	37	19
<b>Age of youngest child</b>						
Single	21	12	43	25	16	35
Age 0-2	11	9	15	11	9	16
Age 3-5	12	11	8	10	10	8
Age 6-11	12	11	8	14	13	10
Age 12-17	10	9	6	11	10	8
<b>Married no children</b>						
children	11	9	15	12	10	15
<b>Marital status</b>						
Single	21	12	43	25	16	35
Married	10	9	11	10	9	13
Divorced	40	33	16	37	32	14
Widowed	16	14	9	10	9	9
<b>Total</b>	16	11	31	17	12	26
N	55,650	55,650	9,047	49,733	49,733	7,812

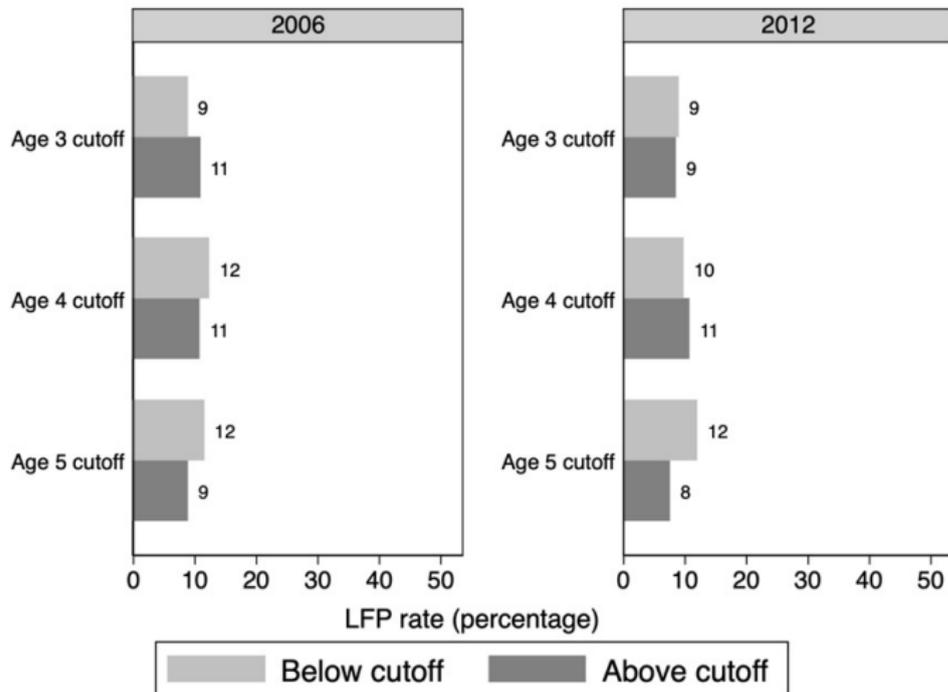
Source: Authors' calculations based on MICS 2006 and MICS 2012.

# Women's labor market outcomes by youngest child age (percentage), 2006 and 2012



Source: Authors' calculations based on MICS 2006 and MICS 2012

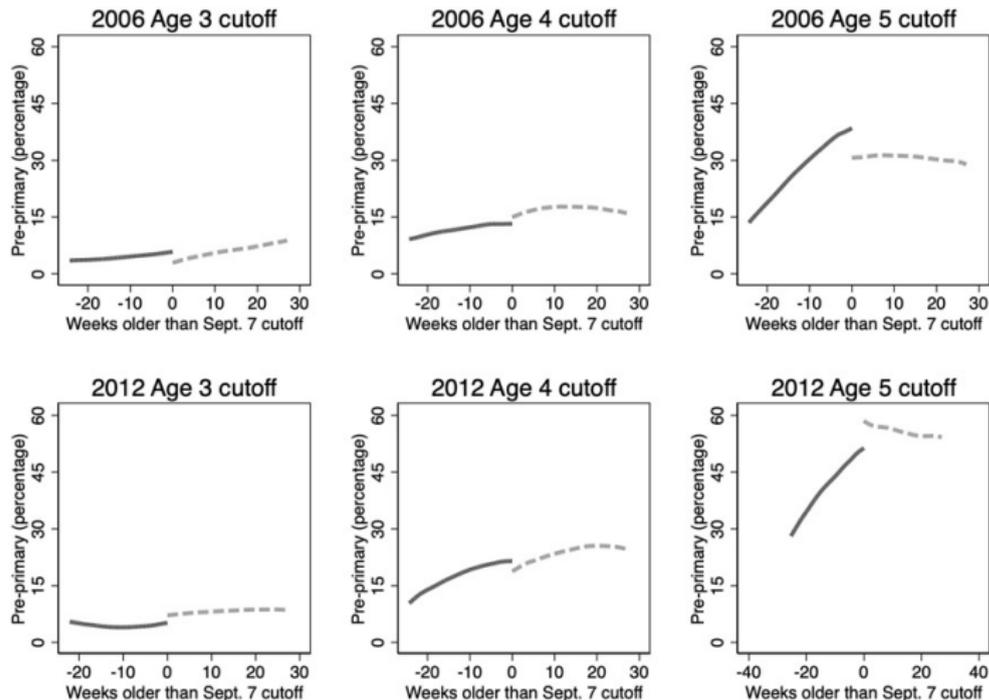
# Women's labor force participation (percentage) by youngest eligible child above or below September 7 cutoff, youngest eligible child's age group, and year



Source: Authors' calculations based on MICS 2006 and MICS 2012. Notes: Estimates based on rd command with bandwidth 25 and six bins on each side of the cutoff.

# Discontinuity in pre-primary

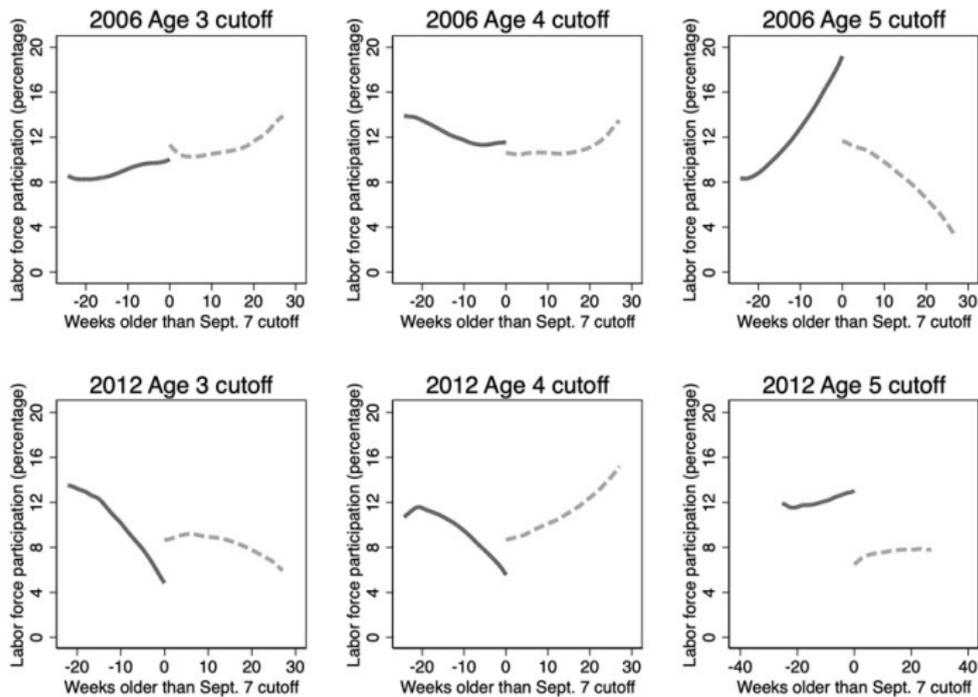
Pre-primary by weeks from September 7 cutoff, youngest eligible child's age group and year



Source: Authors' calculations based on MICS 2006 and MICS 2012. Notes: Estimates based on rd command with bandwidth 25 and six bins on each side of the cutoff.

# Non-parametric RDD estimates

Women's labor force participation (percentage) by weeks from September 7 cutoff, youngest eligible child's age group, and year



Source: Authors' calculations based on MICS 2006 and MICS 2012. Notes: Estimates based on rd command with bandwidth 25 and six bins on each side of the cutoff.

## Results - Regression analysis

Linear probability model for FLFP, women with children in eligibility group for age 5 in 2012

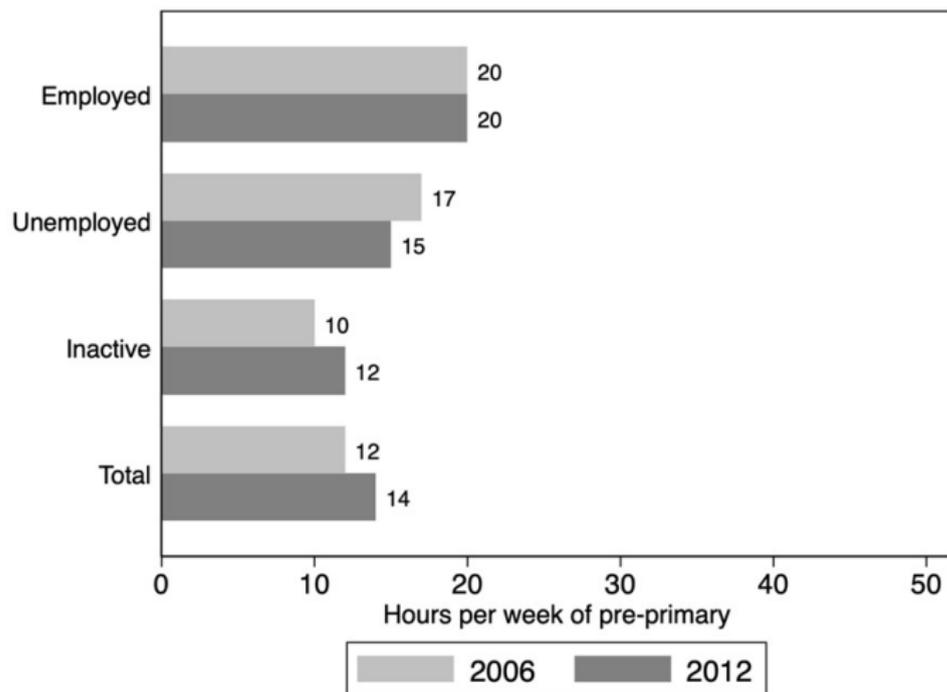
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<b>Youngest eligible child above cutoff (below omit.)</b>	
Above cutoff	-6.414** (2.031)
<b>Weeks from cutoff</b>	
Weeks	0.130 (0.069)
Weeks squared	0.001 (0.003)
<b><u>Presence of children</u></b>	
Have male children 0-2	1.683 (1.272)
Have female children 0-2	-1.440 (1.282)
Have male children 3-5	-3.257 (1.859)
Have female children 3-5	-2.235 (1.827)
Have male children 6-11	-1.489 (1.167)
Have female children 6-11	-0.159 (1.164)
Have female children 12-17	-1.175 (1.446)
Have male children 12-17	-0.111 (1.448)

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<b>Education (none omit.)</b>	
Primary	0.029 (1.631)
Middle	3.307* (1.555)
Secondary	9.996*** (1.680)
Tertiary	55.724*** (2.404)
<b>Marital status (single omit.)</b>	
Married	8.799 (7.506)
Divorced	38.478*** (8.535)
Widowed	41.437*** (9.019)
<b>Age group dummies included</b>	✓
<b>Location dummy (urban vs rural) included</b>	✓
<b>Regional dummies included</b>	✓
<b>Constant</b>	-2.555 (8.651)
<b>N</b>	2537

# Median hours of pre-primary education per week for youngest child by women's labor market status, women with youngest child in pre-primary



Source: Authors' calculations based on MICS 2006 and MICS 2012

- We find that the expansion of pre-primary actually decreased female labor force participation, particularly for women with children aged five in 2012.
- We explain this counter-intuitive result by the fact that pre-primary education is a half day (median of 14 hours per week), making it more difficult for women to work than if they used full-day nursery care.
- These results are, in part, aligned with studies elsewhere that show full-day kindergarten or afterschool care can increase FLFP (Berthelon, Oyarzún, & Kruger, 2015; Cannon, Jacknowitz, & Painter, 2006; Dhuey, Lamontagne, & Zhang, 2019; Martínez A. & Perticará, 2017).
- However, our paper is the first to show that part-day schooling actually reduces FLFP.
- These results may be due to the challenging and low-FLFP context in Algeria. They underline the importance of careful policy design in attempting to increase FLFP in low-FLFP contexts.

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