Craigslist's Effect on Violence Against Women

Scott Cunningham, Gregory DeAngelo and John Tripp

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Prostitute Mortality

Providing sex services illegally is a very risky occupation

- Workplace homicide rate for female prostitutes (204 per 100,000) vs. female liquor store employee (4 per 100,000) (Lowman and Fraser 1995; Castillo and Jenkins 1994)

- Homicide rate more than 13 times higher than the general population (Potterat et al., 2004).

Serial killings

- 65% of serial murders are female and 78% of female victims of serial murderers are prostitutes (Egger, 2003)

- 35% of all prostitute homicides were by serial killers (Brewer et al., 2006)

Matching before and after Craigslist

- Traditional methods for matching included agencies, streets and pimps, word of mouth, reviews, backpages of alternative weeklies, some expensive advertising sites

- Craigslist was a low cost advertising ($0 - 10) section of the front page that was used exclusively by prostitutes to advertise themselves to clients

- Erotic services (ERS) matched buyers and sellers on a centralized advertising platform

- Lowered matching costs, thickened the online market, feedback effects, improved matching efficiency

Mitigating risks through Craigslist

*"Having the ability to advertise online allows sex workers to more carefully screen potential customers and work indoors. Research shows that when sex workers can't advertise online and screen clients, they are often forced onto the street, where it is more difficult to screen out **violent clients** and negotiate safe sex (i.e. sex with condoms). They are also more likely to have to depend on exploitative pimps to find customers for them." - Bass (2015)*

Overview

- We estimate the effect of Craigslist's ERS on violence against women
- ERS lowered female homicides by between 1 and 17 percent, and imprecise estimates on female rape offenses
- Our evidence suggests that this was caused by lower tier prostitutes (e.g., street), who have the highest homicide risks, moving indoors.

Craigslist ERS

- Craigslist itself is the 15th most popular website in the US, cheap advertising, better matching, more business, low search costs
- ERS was protected by 1996 Communication Decency Act
- But nevertheless continual harassment by district/state/US attorneys and activists
- Craigslist closed ERS in September 2010
  - Village Voice's Backpage was immediately adopted replacement
  - . . . closed its ERS in early 2017 (also due to harassment)

Erotic services as a clearinghouse

- Lowers search and solicitation costs
- Easier for buyers and sellers to find one another
- *Allegedly* moves outdoor prostitution (e.g., streets) indoors
- Allows for more efficient matching
- Thickens the online market

Screening

- Email vs split-second decisions
- Call the John at work
- Background checks
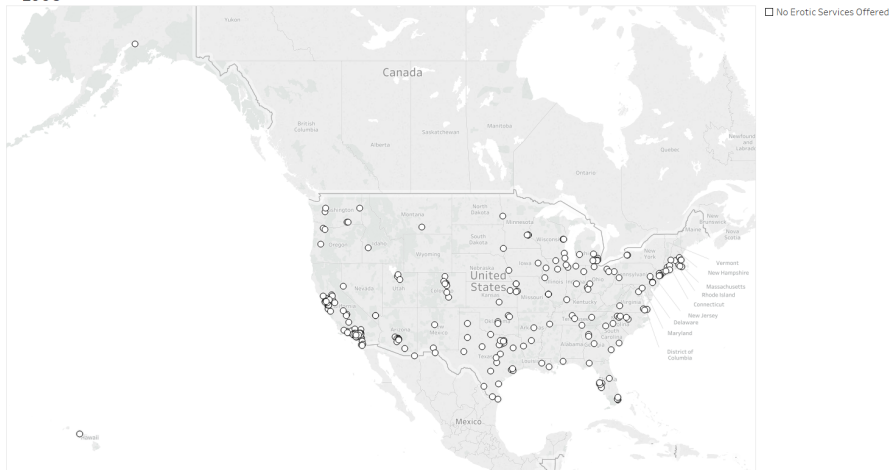- References and White Lists

1995

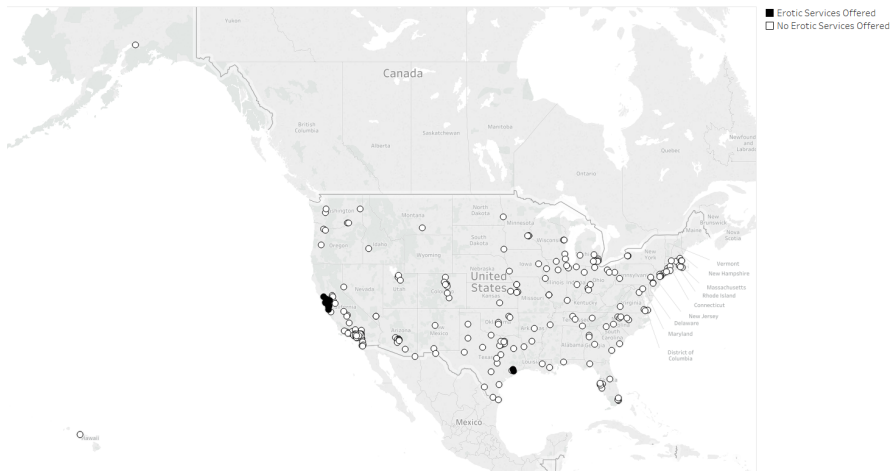Figure: Craigslist ERS in 1995

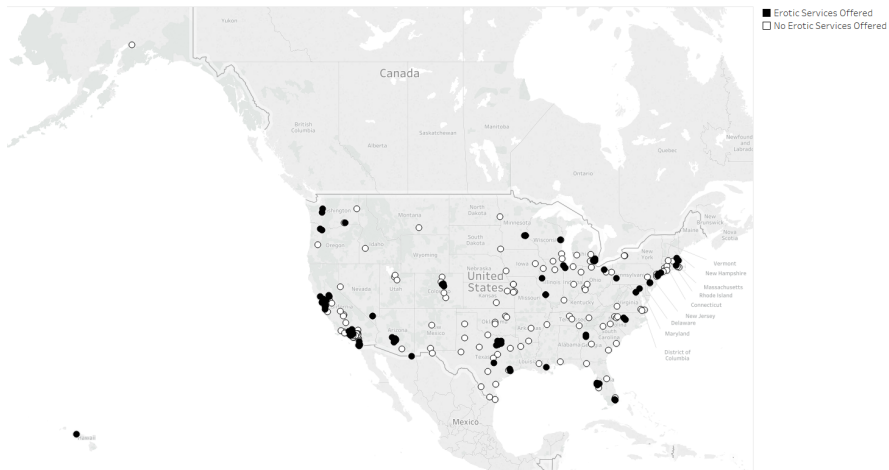April 2003

Figure: April 2003

Jan 2004

Figure: January 2004

Jan 2005
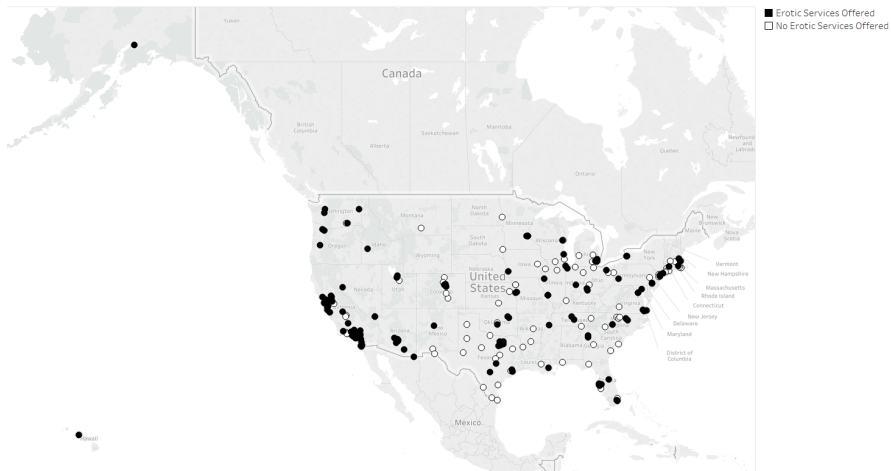
Figure: January 2005

Jan 2006

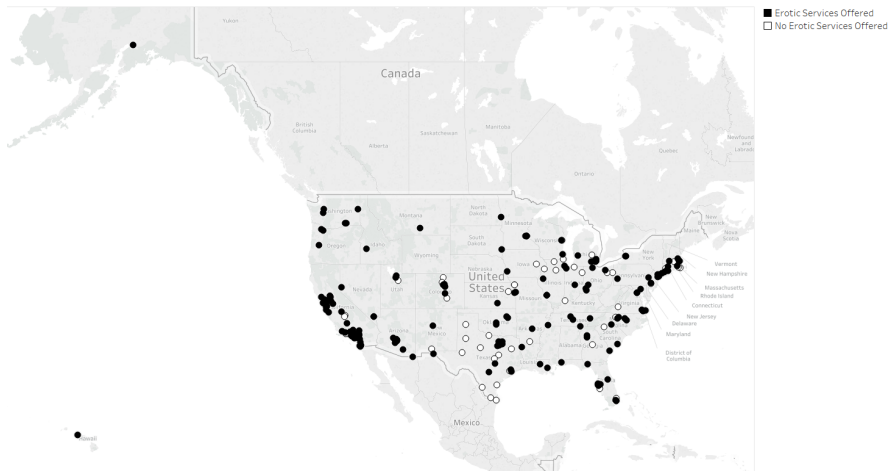■ Erotic Services Offered
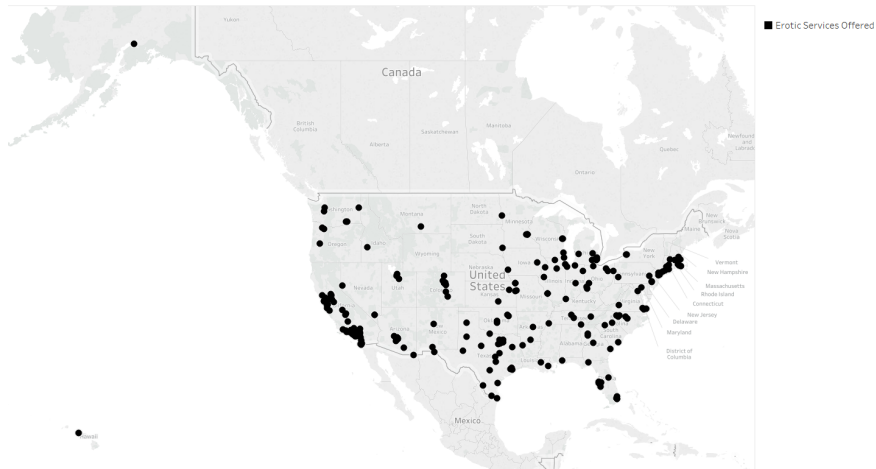□ No Erotic Services Offered

Figure: January 2006

2009

Figure: End of 2009

listing on craigslist

FAQ   subscriptions

search craigslist

community
search

nyc@craigslist.org

1.800.664.0633

about craigslist

artists / musicians (81)

general community (97)

events / entertainment (34)

ridesharing (25)

discussion forums

personals - new

women seeking men (15)

women seeking women (9)

men seeking women (34)

men seeking men (8)

missed connections (34)

apartments (50)

apts - broker/fee (102)

rooms / shared (87)

sublet / temp / vac (195)

swap (138)

apts wanted (118)

room / share wanted (110)

sublet / temp wanted (152)

sale / wanted

general for sale (167)

computer / tech stuff (28)

tickets (43)

items wanted (52) -;new

accounting / finance (11

business / e-biz / mgmt

computer / engineering

design / media / multime

marketing / advertising /

office / admin / cust-ser

sales / biz-dev (57)

writing / editing (12)

et cetera jobs (13)

services

resumes (331)

freelance / 1099 (130)

small biz ads (179)

all listings are free........ questions/comments? ------> nyc@craigslist.org

Figure: Craigslist 1.0 (NYC)

Figure: 14 "services" including ERS

Data

1. Wayback Machine (Internet archive)
2. Supplemental Homicide Reports 1995-2009 (city/month)
3. Summary Uniform Crime Reports, offenses 1995-2009 (city/month)
4. *The Erotic Review* 1999-2009 (city/month)

Underascertainment bias

- Prostitution deaths appear only 49 times out of 31,250 observations caused by underascertainment bias

    The monthly reporting schedule for participating agencies "requires agencies to report homicides in the month that they are discovered, even if that is not the month in which they occurred or if the social context of the homicide is not yet known. Prostitute homicides often go undetected for weeks, months, or years, so the SHR procedures have a built-in bias toward under ascertainment of many prostitute homicides"

- We therefore only focus on the total female homicide rate.

Yelp of Prostitution

- *The Erotic Review* (TER) is a reputation website where clients review prostitutes
- Popular institution; sex workers value their reputation
- Over 1.4 million reviews on hundreds of thousands of unique providers (April 2017)

Poisson Estimation

(Standard and Dynamic) Differences-in-differences

$$E[Y_{mt}|D_{<10,mt}, D_{\geq 10,mt}, X_{mt}] = exp(\delta_1 D_{<10,mt} + \delta_2 D_{\geq 10,mt} + \beta X_{mt})$$

$$E[Y_{mt}|\sum_{j=2}^{6} L_{mt}, \sum_{i=1}^{8}, D_{mt}, X_{mt}] = exp(\sum_{j=2}^{6} \gamma_j L_{mt} + \sum_{i=1}^{8} \delta_i D_{mt} + \beta X_{mt})$$

$D_{<10,mt}$ is the first ten months after ERS opens in a city/market by month; $D_{\geq 10,mt}$ is after ten months; X includes calendar date and city/market fixed effects; L_{mt} and D_{mt} are ten month leads and lags. All models adjust for within-city serial correlation.

Alternative OLS specifications

$$Y_{mt} = \delta_1 D_{<10,mt} + \delta_2 D_{\geq 10,mt} + \beta X_{mt} + \varepsilon_{mt}$$
$$Y_{mt}^{\frac{1}{4}} = \delta_1 D_{<10,mt} + \delta_2 D_{\geq 10,mt} + \beta X_{mt} + \varepsilon_{mt}$$
$$ln(Y_{mt}^2 + (Y_{mt}^2 + 1)^{\frac{1}{2}}) = \delta_1 D_{<10,mt} + \delta_2 D_{\geq 10,mt} + \beta X_{mt} + \varepsilon_{mt}$$

where the first equation uses the rate, the second the quartic root, the third the inverse hyperbolic sine, and ε_{mt} is the error term. All models adjust for within-city serial correlation.

Robustness

- 6-mo, 9-mo and 12-mo lagged treatment variables: results are always significant on the lag. We use 10-month to correspond with the Craigslist visual

- We also controled for state-linear trends, and results don't change

- We also conducted randomization inference with 1,000 randomized treatments

TS Kristine

TER ID: 317421

★★★★★ 🔒

[Review Provider]

General Information

Ad Website	Report New Website URL		
Personal Website	Report New Website URL		
Email	**mf3fm-5943544580@serv.craigslist.org**		
Agency	Independent	Service	Escort/Massage
City	Revere, MA	Other City Serviced	None
Phone	(617) 412-6678	Phone Type	Provider Picks Up
Phone 2	(781) 629-5794	Phone 2 Type	Provider Picks Up
Incall/Outcall	Incall	Smokes	No
On Time	Yes	Availability	Daytime/Nighttime
Porn Star	No	Services Delivered As Promised	Yes

★ Add To Favorites
✈ Report A Problem
🔗 Link to this Review

Cost Of Service

Service
🔒 VIP only
Length
🔒 VIP only
Price
🔒 VIP only

Check out our VIP Section section for info on becoming a supporter of The Erotic Review. Being a supporter of this site gains you access to the Explicit part of search form, plus alot of other nice stuff.

Appearance

Build	Athletic	Photo Accurate	Photos accurate
Ethnicity	Asian	Height	5'3" - 5'5"

Craigslist penetration, measured by email use
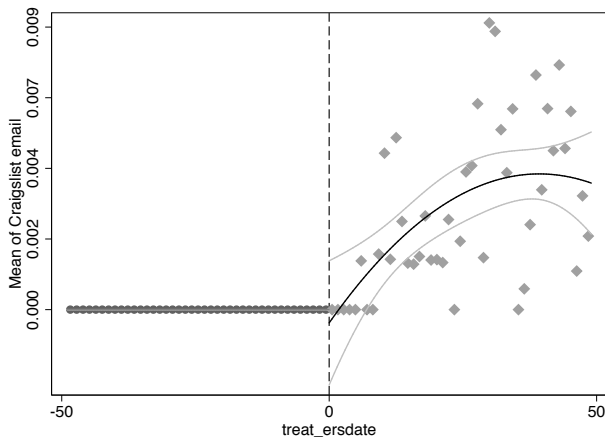
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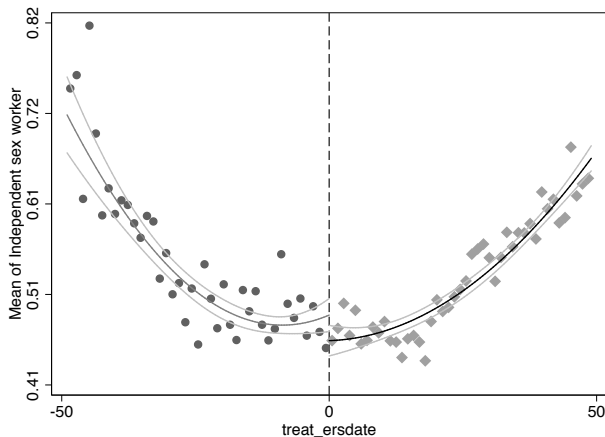
Craigslist penetration, Probability Agency

Table: Poisson and OLS estimates of the effect of erotic services openings on female murders per 100,000

Dep var:	**Murders**			
	Poisson	Rate	Quartic root	Sine
ERS (first 10 months)	-0.015	-0.000	-0.005	-0.002
	(0.076)	(0.010)	(0.008)	(0.006)
ERS (post-10 months)	-0.192**	-0.019**	-0.016*	-0.011*
	(0.077)	(0.009)	(0.009)	(0.006)
N	60,207	60,207	60,207	60,207
Mean of dependent variable	0.13	0.13	0.19	0.09
Dep var:	**Rapes**			
	Poisson	Rate	Quartic root	Sine
ERS (first 10 months)	-0.013	-0.029	-0.029*	-0.039
	(0.030)	(0.079)	(0.016)	(0.037)
ERS (post-10 months)	-0.047	-0.077	-0.060**	-0.109*
	(0.044)	(0.111)	(0.027)	(0.058)
N	58,636	58,636	58,636	58,636
Mean of dependent variable	2.76	2.76	0.97	1.81

The first column estimates a poisson maximum likelihood model with the rate as the outcome. The second model estimates OLS with the rate as the outcome. The third model estimates the hyperbolic sine transformation as the outcome. Models control for market and calendar date fixed effects. Robust standard errors clustered within city in parenthesis. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Dynamic Diff-in-Diff of ERS on Female Homicides with counts and Poisson
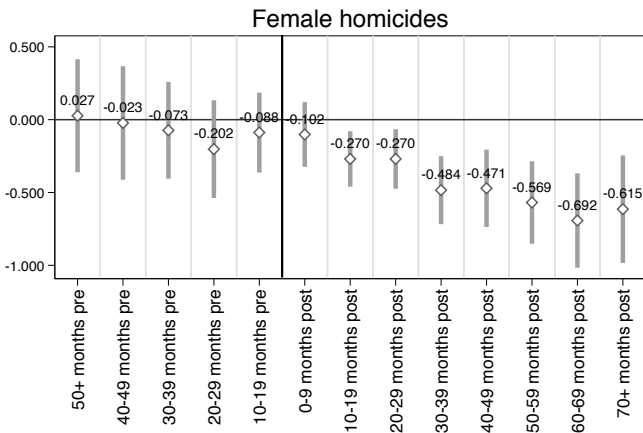
Female homicides

Model estimated with Poisson includes date and city fixed effects

Levels

Quartic root   Hyperbolic sine

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Dynamic Diff-in-Diff of ERS on Female Rapes with counts and Poisson
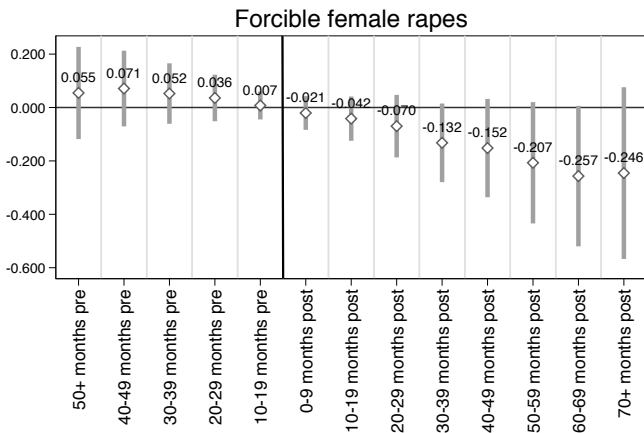
Forcible female rapes

Model estimated with Poisson includes date and city fixed effects

Levels

Quartic root   Hyperbolic sine

Table: Falsification exercises: the effect of Craigslist's erotic services on females murdered by acquaintances, all male murders and all manslaughters per 100,000

Dep var:	**Females by acquaintances**	**Males**	**Manslaughters**
ERS (first 10 months)	0.159	-0.001	0.057
	(0.178)	(0.034)	(0.224)
ERS (post-10 months)	0.110	-0.020	0.165
	(0.184)	(0.057)	(0.304)
N	60,381	60,381	58,636
Mean of dependent variable	0.02	0.48	0.01

Dependent variables are outcomes per population times 100,000. Models estimated with Poisson. Models control for city and date fixed effects. Robust standard errors clustered within city in parenthesis. * p<0.10, ** p<0.05, *** p<0.01

Mechanisms: Streets and Screening

- We do not have reliable or comprehensive data on street walkers, but we can test the hypothesis using the data from *TER*
  - Examine characteristics of provider (prices, appearance, performance, incall/outcall) to see if there's evidence of entry coming from lower tiers
- Classifiers and additional scraping were built to determine whether screening or signaling was used by the service provider
  - Search engines (google, yahoo, bing!, etc.)
  - Call at client's place of employment
  - Background checks
  - White Lists and informal letters of reference - Cunningham & DeAngelo (2017)

Incumbents vs. Entrants

$$Y_{imt} = \sum_{\tau=1}^{6} \delta_{t+\tau} E_{i,t+\tau} + \sum_{\tau=1}^{6} \gamma_{t+\tau} D_{m,t+\tau} + \beta X_{mt} + \varepsilon_{imt}$$

where Y_{imt} are provider and review-specific characteristics, D_{mt} is an indicator equalling one if the market has ERS yet, E_{it} is an indicator equalling one if the respondent had entered t months after ERS (i.e., entrant) compared to people who had entered before ERS, X_{mt} are market and calendar date fixed effects, and ε_{imt} is the error term. The model is estimated with OLS, and standard errors are adjusted for within-market correlation.

Table: The effect of Craigslist's erotic services openings on characteristics of entrants

Dep var:	Screen	Repeat	Looks	Performance	Street	As promised	Real photo	Incall	Price
					Panel A				
ERS (first 10 months)	0.000	0.020**	-0.053*	-0.066*	-0.003*	-0.001	-0.009	0.049***	-6.624*
	(0.004)	(0.009)	(0.030)	(0.034)	(0.001)	(0.012)	(0.015)	(0.013)	(3.555)
ERS (post-10 months)	-0.005	0.027**	-0.131***	-0.110*	-0.003*	0.004	-0.022	0.087***	-14.823**
	(0.007)	(0.013)	(0.049)	(0.064)	(0.002)	(0.018)	(0.020)	(0.024)	(6.246)
					Panel B				
Entrant 0-10mo post ERS	-0.002	0.004	-0.122***	-0.489***	0.000	-0.051***	-0.099***	-0.038***	-17.226***
	(0.002)	(0.004)	(0.035)	(0.063)	(0.001)	(0.015)	(0.015)	(0.009)	(5.100)
Entrant 11-20mo post ERS	-0.006**	0.011**	-0.074**	-0.430***	0.004***	-0.049***	-0.065***	-0.006	-11.016**
	(0.003)	(0.004)	(0.033)	(0.042)	(0.001)	(0.014)	(0.017)	(0.015)	(5.410)
Entrant 21-30mo post ERS	-0.002	0.005	-0.170***	-0.469***	0.001	-0.054***	-0.039***	-0.007	-21.764***
	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
	(0.003)	(0.003)	(0.023)	(0.033)	(0.001)	(0.010)	(0.016)	(0.011)	(6.673)
Entrant 50mo post ERS	-0.039***	0.009**	-0.522***	-1.073***	0.006***	-0.098***	-0.090***	-0.046***	-10.312
	(0.004)	(0.004)	(0.017)	(0.049)	(0.001)	(0.009)	(0.012)	(0.006)	(6.353)
N	344,561	344,561	344,561	344,561	344,561	68,450	68,450	68,450	344,339
Mean of dependent variable	0.05	0.15	7.46	7.32	0.02	0.87	0.79	0.84	294.33

Models control for city and date fixed effects. Robust standard errors clustered within city in parenthesis. * p<0.10, ** p<0.05, *** p<0.01

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	(0.003)	(0.003)	(0.023)	(0.033)	(0.001)	(0.010)	(0.016)	(0.011)	(6.673)
Entrant 50mo post ERS	-0.039***	0.009**	-0.522***	-1.073***	0.006***	-0.098***	-0.090***	-0.046***	-10.312
	(0.004)	(0.004)	(0.017)	(0.049)	(0.001)	(0.009)	(0.012)	(0.006)	(6.353)
N	344,561	344,561	344,561	344,561	344,561	68,450	68,450	68,450	344,339
Mean of dependent variable	0.05	0.15	7.46	7.32	0.02	0.87	0.79	0.84	294.33

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ERS (first 10 months)	0.000	0.020**	-0.053*	-0.066*	-0.003*	-0.001	-0.009	0.049***	-6.624*
	(0.004)	(0.009)	(0.030)	(0.034)	(0.001)	(0.012)	(0.015)	(0.013)	(3.555)
ERS (post-10 months)	-0.005	0.027**	-0.131***	-0.110*	-0.003*	0.004	-0.022	0.087***	-14.823**
	(0.007)	(0.013)	(0.049)	(0.064)	(0.002)	(0.018)	(0.020)	(0.024)	(6.246)
					Panel B				
Entrant 0-10mo post ERS	-0.002	0.004	-0.122***	-0.489***	0.000	-0.051***	-0.099***	-0.038***	-17.226***
	(0.002)	(0.004)	(0.035)	(0.063)	(0.001)	(0.015)	(0.015)	(0.009)	(5.100)
Entrant 11-20mo post ERS	-0.006**	0.011**	-0.074**	-0.430***	0.004***	-0.049***	-0.065***	-0.006	-11.016**
	(0.003)	(0.004)	(0.033)	(0.042)	(0.001)	(0.014)	(0.017)	(0.015)	(5.410)
Entrant 21-30mo post ERS	-0.002	0.005	-0.170***	-0.469***	0.001	-0.054***	-0.039***	-0.007	-21.764***
	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
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	(0.003)	(0.004)	(0.033)	(0.042)	(0.001)	(0.014)	(0.017)	(0.015)	(5.410)
Entrant 21-30mo post ERS	-0.002	0.005	-0.170***	-0.469***	0.001	-0.054***	-0.039***	-0.007	-21.764***
	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
	(0.003)	(0.003)	(0.023)	(0.033)	(0.001)	(0.010)	(0.016)	(0.011)	(6.673)
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	(0.004)	(0.009)	(0.030)	(0.034)	(0.001)	(0.012)	(0.015)	(0.013)	(3.555)
ERS (post-10 months)	-0.005	0.027**	-0.131***	-0.110*	-0.003*	0.004	-0.022	0.087***	-14.823**
	(0.007)	(0.013)	(0.049)	(0.064)	(0.002)	(0.018)	(0.020)	(0.024)	(6.246)
					Panel B				
Entrant 0-10mo post ERS	-0.002	0.004	-0.122***	-0.489***	0.000	-0.051***	-0.099***	-0.038***	-17.226***
	(0.002)	(0.004)	(0.035)	(0.063)	(0.001)	(0.011)	(0.015)	(0.009)	(5.100)
Entrant 11-20mo post ERS	-0.006**	0.011**	-0.074**	-0.430***	0.004***	-0.049***	-0.065***	-0.006	-11.016**
	(0.003)	(0.004)	(0.033)	(0.042)	(0.001)	(0.014)	(0.017)	(0.015)	(5.410)
Entrant 21-30mo post ERS	-0.002	0.005	-0.170***	-0.469***	0.001	-0.054***	-0.039***	-0.007	-21.764***
	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
	(0.003)	(0.003)	(0.023)	(0.033)	(0.001)	(0.010)	(0.016)	(0.011)	(6.673)
Entrant 50mo post ERS	-0.039***	0.009**	-0.522***	-1.073***	0.006***	-0.098***	-0.090***	-0.046***	-10.312
	(0.004)	(0.004)	(0.017)	(0.049)	(0.001)	(0.009)	(0.012)	(0.006)	(6.353)
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	(0.004)	(0.009)	(0.030)	(0.034)	(0.001)	(0.012)	(0.015)	(0.013)	(3.555)
ERS (post-10 months)	-0.005	0.027**	-0.131***	-0.110*	-0.003*	0.004	-0.022	0.087***	-14.823**
	(0.007)	(0.013)	(0.049)	(0.064)	(0.002)	(0.018)	(0.020)	(0.024)	(6.246)

					Panel B				
Entrant 0-10mo post ERS	-0.002	0.004	-0.122***	-0.489***	0.000	-0.051***	-0.099***	-0.038***	-17.226***
	(0.002)	(0.004)	(0.035)	(0.063)	(0.001)	(0.011)	(0.015)	(0.009)	(5.100)
Entrant 11-20mo post ERS	-0.006**	0.011**	-0.074**	-0.430***	0.004***	-0.049***	-0.065***	-0.006	-11.016**
	(0.003)	(0.004)	(0.033)	(0.042)	(0.001)	(0.014)	(0.017)	(0.015)	(5.410)
Entrant 21-30mo post ERS	-0.002	0.005	-0.170***	-0.469***	0.001	-0.054***	-0.039***	-0.007	-21.764***
	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
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Entrant 50mo post ERS	-0.039***	0.009**	-0.522***	-1.073***	0.006***	-0.098***	-0.090***	-0.046***	-10.312
	(0.004)	(0.004)	(0.017)	(0.049)	(0.001)	(0.009)	(0.012)	(0.006)	(6.353)

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	(0.002)	(0.003)	(0.028)	(0.037)	(0.002)	(0.010)	(0.011)	(0.008)	(6.888)
Entrant 31-40mo post ERS	-0.012***	0.004	-0.137***	-0.547***	0.002	-0.055***	-0.046***	-0.011	-13.644**
	(0.003)	(0.006)	(0.024)	(0.041)	(0.002)	(0.010)	(0.010)	(0.009)	(5.684)
Entrant 41-50mo post ERS	-0.022***	0.002	-0.252***	-0.667***	0.002	-0.079***	-0.072***	-0.024**	-18.207***
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ERS saved lives

- We calculate that ERS saved between 136 and 2,144 females from murder for 2002-2010 (hyperbolic sine and Poisson bounds)
- Between 13,045 and 207,713 additional police officers needed to achieve equivalent effect
  - Reduction in female homicides of 1.1% (hyerbolic sine) to 17.4% (poisson)
  - Police murder elasticity, ϵ = -0.84 (Evans & Owens, 2007)
  - Total police in 2001 (LEOKA): 1,003,441

Policy Implications

- Client violence (including serial killing?) can be disrupted by technology that moves prostitutes indoors
- ERS appears to have made prostitution markets safer – maybe safest in history
- Potentially unintended consequence of closing down internet institutions: increased risks to vulnerable participants, namely female prostitutes.
- Tradeoffs:
    - reduce the sex trade (including trafficking) vs.
    - reduce harm associated with prohibition
- Movement off the street should be one of the main goals to keep in mind when designing optimal policy