

Mandatory Parental Involvement in Minors' Abortions: Effects of the Laws in Minnesota, Missouri, and Indiana

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ABSTRACT

Objectives. This study examined the effects of parental involvement laws on the birthrate, in-state abortion rate, odds of interstate travel, and odds of late abortion for minors.

Methods. Poisson and logistic regression models fitted to vital records compared the periods before and after the laws were enforced.

Results. In each state, the in-state abortion rate for minors fell (relative to the rate for older women) when parental involvement laws took effect. Data offered no empirical support for the proposition that the laws drive up birthrates for minors. Although data were incomplete, the laws appeared to increase the odds of a minor's traveling out of state for her abortion. If one judges from the available data, minors who traveled out of state may have accounted for the entire observed decline in the in-state abortion rate, at least in Missouri. The laws appeared to delay minors' abortions past the eighth week, but probably not into the second trimester.

Conclusions. Several empirical arguments used against and in support of parental involvement laws do not appear to be substantiated. (*Am J Public Health.* 1997;87:1367-1374)

Introduction

As of May 1993, 10 states required young women under the age of 18 to notify one or both parents before having an abortion.¹ Some states, marked under the column "judicial bypass," allow minors to obtain a court waiver in lieu of notifying the parent(s). Another 11 states require young women to secure parental consent before obtaining an abortion. Together, notification and consent statutes are called parental involvement laws. Two states allow physicians or counselors to waive notification, and 2 states allow adult relatives other than the parents to consent. Additional states carry unenforced parental involvement laws on the books. (Since 1993, there have been some changes in the laws. See Table 1.)

Parental involvement laws, one of the few abortion restrictions left open to interpretation in *Roe v Wade* (410 US 113 [1973]), have been vehemently debated in the courts and legislatures for the past 20 years. Common positive claims are that parental involvement laws (1) make sure minors know their options, (2) offer support for minors during a difficult time, (3) facilitate family unity or resolve family conflict, (4) protect the rights of parents to raise their children, and (5) promote responsible sexual behavior among minors (often interpreted to mean that the laws promote abstinence).^{2,3} A further claim, frequently unstated, is that the laws restrict abortion. Since abortion is legal, however, laws passed explicitly to limit abortion are prohibited, and the laws must claim another purpose in order to withstand legal scrutiny.⁴ Common negative claims are that the laws (1) increase the birthrate by deterring minors from abortion, (2) impede access to competent medical care by compelling minors to travel out of state for abortions, (3) delay

teenagers' abortions, thus increasing medical risk and expense, (4) traumatize minors by forcing them to involve their parents or go to court, and (5) precipitate physical and emotional abuse.⁵⁻⁷ Empirical evidence about these claims could be useful to advocates, legislators, and policymakers as they consider such laws.

Review of Available Empirical Evidence

Parental involvement laws could operate at several points along the chain of events leading to a minor's pregnancy resolution. In principle, parental involvement laws could persuade minors to abstain from sex or to use contraception more effectively. No published studies have examined these putative effects directly.

Although a pivotal legislative assumption about parental involvement laws is that the laws cause pregnant teenagers to choose birth over abortion, no studies satisfactorily document or refute this allegation. One study⁸ analyzed the effect of a parental notification law on Minnesota's abortion-birth ratio, which theoretically reflects the choice of birth over abortion. That study, however, relied upon in-state abortion data, limiting its conclusions. The study assumed away any effect on interstate abortion travel or illegal abortion.

Henshaw and Kost⁹ examined voluntary parental involvement. They surveyed minors obtaining abortions in states with no parental involvement laws in place.

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TABLE 1—Parental Involvement Laws Governing Minors' Access to Abortion, by State: April 1997

State	One Parent Involved	Two Parents Involved	Consent Required	Notice Required	Mandatory Counseling	Judicial Bypass	Enjoined or Not Enforced	Enforced
Alabama	X		X			X		X
Alaska	X		X				X ^a	
Arizona	X		X			X	X ^a	
Arkansas		X		X		X		X
California	X		X			X	X	
Colorado	X		X				X ^a	
Connecticut					X			X
Delaware	X ^{b,e}			X		X		X
Washington, DC								
Florida								
Georgia	X			X		X		X
Hawaii								
Idaho	X			X				X
Illinois	X ^c			X		X	X ^a	
Indiana	X		X			X		X
Iowa	X ^h			X		X	X ^a	
Kansas	X			X	X	X		X
Kentucky	X		X			X		X
Louisiana	X		X			X		X
Maine	X		X		X ^d	X		X
Maryland	X			X				X
Massachusetts	X ⁱ		X			X		X
Michigan	X		X			X		X
Minnesota		X		X		X		X
Mississippi		X	X			X		X
Missouri	X		X			X		X
Montana	X			X		X	X	
Nebraska	X			X		X		X
Nevada	X			X		X	X ^a	
New Hampshire								
New Jersey								
New Mexico	X		X				X ^a	
New York								
North Carolina	X ^b		X			X		X
North Dakota		X	X			X		X
Ohio	X ^f			X		X		X
Oklahoma								
Oregon								
Pennsylvania	X		X			X		X
Rhode Island	X		X			X		X
South Carolina	X ^c		X			X		X
South Dakota	X			X		X	X ⁱ	
Tennessee	X		X			X	X ^a	
Texas								
Utah	X ^g			X				X
Vermont								
Virginia	X			X		X	X ⁱ	
Washington								
West Virginia	X			X ^e		X		X
Wisconsin	X ^h		X			X		X
Wyoming	X		X			X		X
Total	35	4	22	17	3	33	12	28

Source. Reprinted with permission from the National Abortion and Reproductive Rights Action League (NARAL) Foundation/NARAL.

^aThis statute has been declared unenforceable by a court or attorney general.

^bThis statute also allows consent of or notice to a grandparent under certain circumstances.

^cThis statute also allows consent of a grandparent.

^dThis statute offers mandatory counseling as an alternative to one-parent or adult family member consent with a judicial bypass.

^eThis requirement may be waived by a specified health professional under certain circumstances.

^fThis statute also allows notice to a grandparent or adult sibling under certain circumstances.

^gThis statute is a two-parent notice law interpreted as requiring notice to one parent.

^hThis statute allows consent of or notice to a grandparent or certain other adult family members over the age of 25.

ⁱThis statute is written as a two-parent consent law; however, a court has ordered that it be enforced as requiring consent of one parent.

^jThis law will go into effect July 1, 1997.

Among the 1519 minors studied, 66% had voluntarily involved at least one parent. Blum et al.¹⁰ attempted to study the rates of voluntary and catalyzed notification by surveying minors in abortion clinics in the neighboring states, Minnesota and Wisconsin. At the time, Minnesota enforced a parental involvement law while Wisconsin did not. Notification rates among the two groups of minor abortion patients were similar (approximately 40% in each case) despite the different laws. Yet the study contains an important limitation. Abortion patients in Minnesota were those who still became pregnant despite the law, still opted to terminate the pregnancy by legal abortion, and chose not to travel out of state. Such minors are not directly comparable to Wisconsin minors, unencumbered by any parental involvement law.

Data about minors who circumvent the law are difficult to obtain. Other evidence¹¹ shows that for the United States as a whole, curves of abortion rates by single year of age demonstrate a valley at 17 and a marked peak at 18 during a time when many states enforced parental involvement laws. This pattern is not evident for curves of the birthrate in the United States or for curves of abortion rates from other countries. These data are consistent with a hypothesis that some 17-year-olds violate the laws by misstating their age as 18. Yet no published study has directly investigated illegal abortion, self-induced abortion, or other direct ways to disobey parental involvement laws.

Cartoof and Klerman¹² examined rates of interstate travel by minors confronted with Massachusetts' parental involvement law and found that around 40% of Massachusetts minors traveled to surrounding states for abortions. Other studies^{8,10} dismissed travel as a chief effect of the laws without stating full reasoning.

Several studies have examined court permission. Donovan¹³ found that more than 3000 minors had pursued the bypass option in Massachusetts between 1981, when the law was first enforced, and 1983. Blum et al.¹⁴ found that Minnesota minors seeking bypasses were older, poorer, and more religious than those notifying their parents. The proportion of petitions granted varies by state. Minnesota judges tend to grant nearly all petitions, whereas judges in Missouri and Indiana have created a stricter climate.¹⁵

Thus, several areas for further research exist concerning parental involvement laws. Aside from the laws' effects on

the minors' experience during their pregnancies, basic questions about the laws' effects on more easily measured rates of births and abortions remain unsettled.

Methods

Specific claims evaluated in this paper are the following: (1) parental involvement laws drive up the birthrates for minors; (2) the laws cause minors to travel to other states to obtain abortions; and (3) the laws delay minors' abortions. Outcome measures include the birthrate, the in-state abortion rate, the odds of traveling out of state, and the odds that an abortion was delayed.

Selection of Study States

Study states were selected on three criteria: (1) States must have enforced their laws long enough ago that data were available from the period after the law took effect, but not so long ago that there were no data from the period before the law took effect. Ideally, states should have enforced the law for a while, then lifted it, and then enforced it again. (2) Since no state was available from which travel was constrained (e.g., Hawaii or a state surrounded by other states enforcing parental involvement laws), study states ideally permitted examination of travel patterns. A state whose neighbors each had good data on the minors from the original state was considered a good candidate on this criterion. (3) Study states required good quality data as measured against Alan Guttmacher Institute estimates and had to be willing to release them.

Minnesota, Missouri, and Indiana alone fit these criteria. Minnesota has nearly ideal timing. The state started collecting data in 1975 and completed its surveillance system by 1977. In 1981, Minnesota first enforced a parental notification law, which stayed in effect until 1986, when a lower court enjoined the law. In 1990, the US Supreme Court ruled that Minnesota's law could indeed be enforced, and the law took effect once more. Although it is too soon to study the latest enforcement, the initial off-on-off timing of Minnesota's law creates an excellent natural experiment. Another benefit of choosing Minnesota is that evidence collected for the legal challenges to its law supplement any statistical findings. Minnesota's drawback is that it collects data only on in-state abortion. Two of Minnesota's four neighboring states do not collect or release detailed abortion records, eliminating the possibil-

ity of tracking abortion travel. Analysis for Minnesota remains limited to births and in-state abortions.

Missouri offered the best data on travel. Missouri's health department shares data with the health departments of each of its neighboring states (except for Illinois and Iowa), creating at least a partial network of information concerning the travel habits of Missouri minors who leave the state to avoid obtaining parental consent. Yet lack of data from Illinois is troubling since the main clinic in Missouri, Reproductive Health Services, which handles over 50% of abortions in Missouri, refers minors wishing to avoid parental involvement to the Hope Clinic for Women in Granite City, Ill, located immediately across the border. Still, Missouri, with its partial network, proved the best available state for studying the travel question. Although the state of Illinois was prohibited from collecting abortion data in 1983, the Hope Clinic itself started collecting data in 1989. The clinic released summary statistics on Missouri minors served there.

Indiana was the only additional state that was feasible according to the criteria noted. Indiana's department of health collects and releases records of abortions performed on state residents in Indiana. The department also publishes annual tabulations of births and abortions. Indiana's parental consent law first took effect in 1982. During 1983, the law was successfully challenged and enjoined. The following year, however, the law was amended and withstood court scrutiny. Indiana's law has been enforced since 1985.¹⁶

Data

Data, summarized in Tables 2, 3, and 4, came from state health department individual records of births and abortions, from the US Bureau of the Census, and from the Hope Clinic for Women in Granite City, Ill. Birth records were backdated by 6 months to make a cohort of pregnancies conceived at the same time statistically comparable. This backdating adjusts for the fact that abortions occur approximately 3 months into pregnancy, while births occur approximately 6 months later, or 9 months into pregnancy. Without backdating, a pair of pregnancies initiated in the same month (e.g., September 1990) to two women of the same age (e.g., 17.5 years) could be resolved in different calendar years (1990 or 1991) or at different completed ages of the woman (17 or 18), depending on whether the

TABLE 2—Estimated Abortions, Births, and Population: Minnesota Residents, by Age Group and Year, 1977 through 1990

Age Group	Year ^a	Abortions ^b	Births ^c	Population
15 to 17 ^d	1977	2273	3 217	120 813
	1978	2184	3 088	117 190
	1979	2307	3 021	112 905
	1980	2327	2 897	114 431
	1981	1820	2 856	107 156
	1982	1564	2 452	101 275
	1983	1430	2 267	96 641
	1984	1395	2 344	94 838
	1985	1567	2 285	94 927
	1986	1545	2 265	95 533
	1987	1648	2 197	92 500
	1988	1606	2 360	88 409
	1989	1424	2 444	83 553
1990	637	1 178	83 021	
18 to 19	1977	2693	5 236	82 755
	1978	3052	5 530	83 736
	1979	3291	5 705	83 421
	1980	3379	5 723	83 133
	1981	3064	5 270	80 844
	1982	2799	4 873	78 040
	1983	2542	4 340	73 902
	1984	2586	4 232	69 496
	1985	2531	4 009	65 957
	1986	2372	3 605	63 873
	1987	2306	3 653	63 946
	1988	2476	3 810	65 342
	1989	2316	4 047	65 827
1990	1103	1 908	64 076	
20 to 24	1977	5062	18 625	193 612
	1978	5723	19 391	196 263
	1979	6379	20 371	199 588
	1980	6840	20 671	198 732
	1981	6814	20 410	201 616
	1982	6736	19 105	200 705
	1983	6240	17 918	198 204
	1984	6823	18 110	194 826
	1985	6943	16 730	189 653
	1986	6584	15 656	181 367
	1987	6388	14 603	173 316
	1988	6275	14 133	166 985
	1989	6145	13 702	161 505
1990	2979	6 222	158 886	

Source. Data are from the Minnesota Department of Health and the US Bureau of the Census.

^a1990 represents only January through June.

^bIn-state abortions.

^cBirths are backdated 6 months.

^dBirths and abortions to those under 15 are included.

women chose birth (at approximately 9 months' gestation) or abortion (at approximately 3 months' gestation). The relevant age and policy climate are the ones in place at the 3-month mark, when the woman is eligible to decide what the outcome of her pregnancy will be.

Control Groups

To control for natural movement in the outcome measures expected to occur over time, two comparison groups of nonminor women were analyzed: those aged 18 to 19 years, and those aged 20 to

24 years. The older control group accounts for any spillover effects from the minors into the group of older teenagers. For example, if minors who were 17 waited until they were 18 to have an abortion, the odds of an abortion occurring late for 18-year-olds might rise as a result of the law. Control groups were identical for all models.

Model Specification

As described in greater detail elsewhere,¹⁶ three models were fitted to each outcome measure. Each model specifies

the log outcome measure as the dependent variable. The first model specified each log outcome variable as a linear function of legal period, age group, and the interaction between age group and legal period. The second and third models added a time trend to control for natural fluctuation of the outcome measures over time. The former of these time series models included only one time trend (entered linearly and quadratically) for the entire study period. The latter model allowed the effect of time and time-squared to vary by legal period, although not by age. For every outcome measure, these latter models formed the basis of the estimates shown in Tables 5 and 6. In every case, the test statistic was the effect of the law on minors over and above the effect for the control groups of older women, or the estimated coefficient of the interaction term between the older age groups and the legal period. This test statistic has a *z* distribution in large samples.

Estimation Techniques

Poisson regression was used to estimate models of birth, abortion, and pregnancy rates.¹⁷ As is appropriate for count data, such as those used in the present analysis, where the variance is proportional to the mean, Poisson regression treats the log mean count as a linear function of the covariates, adjusted for exposure. For example, in the model of birthrates for Minnesota used to generate Tables 5 and 6, the natural logarithm of the number of births each month is modeled as a function of time (entered linearly and quadratically), age group, legal period, and the interactions between age group and legal period) and between time and legal period. The natural logarithm of the mid-month female population (interpolated from annual census data) is used as an offset. Models of odds were estimated by means of logistic regression.¹⁸ Logistic regression is appropriate for dichotomous data and treats the log odds as a linear function of the covariates. For example, in the model of odds that a Minnesota in-state abortion would occur later than 12 weeks' gestation (used to generate Tables 5 and 6), the natural logarithm of the odds of an abortion's occurring after 12 weeks for each month is modeled as a function of time (entered linearly and quadratically), age group, legal period, and interactions between age group and legal period and between time and legal period.

Models typically fit well, often explaining over 90% of the deviance, as measured by chi-squared statistics. In addition, results tended to be highly significant, generally beyond the .001 level. Rarely did a substantive result depend on the choice of model or comparison group. When the choice of comparison age group did make a difference, it was usually in the models of delay, the outcome most prone to spillover effects.

Results

Table 5 presents the percentage change between the end of the last period without the law and the beginning of the first period with the law. Results are derived from the last model described above, which included a time variable entered linearly and quadratically for each legal period. Asterisks indicate changes that are significantly different for minors than for their older counterparts. Table 6 presents results from analogous analysis concerning the removal of Minnesota's parental notification law in 1986.

Birthrates

Confirming and extending the finding from Rogers et al.,⁸ this analysis found no evidence that parental involvement laws drive up the birthrate. The finding was true for each model, each comparison age group, and each study state. In no case did the birthrate for minors rise (or fail to fall) more than the birthrate for older teenagers or for women in their early 20s. In addition, when Minnesota's law was lifted, the birthrate for minors did not fall. Such a fall might have been expected if the birthrate was boosted by the parental notification law.

In-State Abortion Rates

The in-state abortion rates for minors fell in every state when parental involvement laws were imposed. This result was also insensitive to model specification, control group, and study state. When Minnesota's law was lifted, the in-state abortion rate for minors rose relative to that of older women.

Travel

Findings for all outcome measures besides the birth and in-state abortion rate suffered from the lack of complete travel data. In-state abortion rates for minors in all three states were significantly lower when the laws were in effect than would be predicted otherwise, but it is unclear whether these drops are true decreases or

TABLE 3—Estimated Abortions, Births, and Population: Missouri Residents, by Age Group and Year, 1977 through 1990

Age Group	Year	Abortions ^a	Births ^b	Population
15 to 17 ^c	1977	2051	7 210	138 330
	1978	2389	6 914	135 362
	1979	3019	6 837	130 656
	1980	2619	6 680	139 105
	1981	2458	6 016	123 368
	1982	3073	5 690	116 524
	1983	2559	5 375	110 695
	1984	2470	5 226	109 500
	1985	2714	5 132	110 343
	1986	2122	5 084	110 078
	1987	1860	5 240	112 383
	1988	1594	5 331	108 499
	1989	1677	5 557	102 276
1990	1470	5 734	100 389	
18 to 19	1977	2312	6 090	93 778
	1978	2481	6 079	93 860
	1979	2314	6 419	91 808
	1980	2840	6 511	95 845
	1981	2641	6 011	86 938
	1982	2839	5 694	83 173
	1983	2599	5 478	78 464
	1984	3057	5 214	74 671
	1985	2246	5 196	72 496
	1986	2260	4 980	74 763
	1987	2143	4 788	74 479
	1988	2143	5 110	76 707
	1989	2103	5 427	74 756
1990	2185	5 676	71 289	
20 to 24	1977	2970	25 295	225 486
	1978	2484	25 299	227 738
	1979	3216	26 798	229 974
	1980	3288	27 487	221 122
	1981	3451	26 577	228 604
	1982	3703	26 200	228 120
	1983	3604	25 403	227 627
	1984	3528	24 208	225 426
	1985	3516	24 787	220 344
	1986	3384	23 395	220 296
	1987	3215	22 504	202 000
	1988	3081	21 674	192 850
	1989	2882	21 806	185 246
1990	3123	21 622	181 918	

Source. Data are from the Missouri Department of Health and the US Bureau of the Census.

^aIn-state abortions.

^bBirths are backdated 6 months.

^cBirths and abortions to those under 15 are included.

are simply attributable to travel. Several papers and fact sheets have interpreted the drop in in-state abortion rates for minors in Minnesota as a true decrease in abortions resulting from the law.^{8,19} More caution may be advisable. In Missouri, the state with the best, if still incomplete, data on travel, the odds of travel definitely increased for minors (by over 50%) when the law took effect. Increases for older teenagers and women in their early 20s were significantly smaller, at 13% and 18%, respectively. Before Missouri's parental consent law, there was no difference across age groups in the propensity to

travel, at least to those states belonging to Missouri's data network. After the law took effect, minors were significantly more likely to travel than were older women, and the overall pattern shifted to increase rather than decrease.

While the odds of interstate travel for minors almost certainly increased in Missouri, the extent of travel is uncertain. Could this travel account for the entire decline in in-state abortions? The leading study on the topic of travel¹² found that minors faced with a parental consent law in Massachusetts traveled to other states in large enough numbers to offset the

TABLE 4—Estimated Abortions, Births, and Population: Indiana Residents, by Age Group, 1978 through 1988

Age Group	Year	Abortions ^a	Births ^b	Population
15 to 17 ^c	1978	1709	8 017	156 513
	1979	2081	8 100	153 049
	1980	2271	7 610	158 694
	1981	2023	6 708	144 333
	1982	1849	6 331	136 668
	1983	1384	6 008	129 889
	1984	1734	5 652	127 784
	1985	1516	5 673	127 815
	1986	1414	5 531	130 568
	1987	1320	5 522	129 903
1988	1235	5 448	125 766	
18 to 19	1978	2239	7 460	108 141
	1979	2548	7 643	106 193
	1980	2766	7 596	106 087
	1981	2540	6 743	101 120
	1982	2701	6 391	97 719
	1983	2292	6 237	91 791
	1984	2465	5 643	87 840
	1985	2428	5 718	85 361
	1986	2264	5 553	84 465
	1987	2034	5 325	86 582
1988	2073	5 731	89 562	
20 to 24	1978	4186	30 453	265 766
	1979	4986	31 943	267 683
	1980	5603	32 293	257 181
	1981	5254	30 499	264 022
	1982	5454	29 807	261 815
	1983	4949	27 857	256 687
	1984	5429	27 046	252 085
	1985	5535	26 957	245 475
	1986	5269	25 432	234 738
	1987	4681	24 395	226 346
1988	4280	24 816	218 457	

Source. Data are from the Indiana State Department of Health and the US Bureau of the Census.

^aIn-state abortions.

^bBirths are backdated 6 months.

^cBirths and abortions to those under 15 are included.

reductions in in-state abortions. Would a similar result obtain elsewhere?

Models of in-state abortions in Missouri can be used to calculate how many fewer abortions for minors there were than might have been expected in the absence of the law. These "missing abortions" may be attributable to travel, true reductions in pregnancy (although not shifts into births, as births did not increase), or some other explanation. We could then compare these missing abortions with the number of abortions known to be performed on Missouri minors in other states during a given time period. In the case of Missouri, the first quarter of 1989 makes a sensible test period. During that time, the first data from the clinic in Illinois are available, along with data from Missouri's neighboring states of Arkansas, Kansas, Nebraska, Oklahoma, and Tennessee. The models predict 75 missing

abortions for minors in Missouri during the first quarter of 1989 and 19 excess abortions for Missouri minors in other states in the data network during the first quarter of 1989. Therefore, if there were at least 56 abortions (75 - 19 = 56) performed on Missouri minors in Illinois and Iowa that quarter, we cannot eliminate travel as a complete explanation for the decline in the in-state abortion rate.

Data indicate that the Hope Clinic in Illinois performed 101 abortions on Missouri minors during the first quarter of 1989. Thus, we cannot rule out travel as a complete explanation for the dip in the in-state abortion rate following the enforcement of Missouri's parental involvement law. It is unclear how many (if any) of the 101 are excess abortions attributable to the law as we do not know the number performed before Missouri's law took effect. We can conclude only that travel

might explain the entire drop in Missouri's in-state abortion rate for minors.

Delay

Evidence concerning delay is mixed. On the basis of in-state findings, the laws do not push a significant proportion of minors' abortions into the second trimester, at least in Minnesota and Indiana. Examinations of an 8-week instead of a 12-week cutoff, however, yield different answers in some cases. Abortion data from Minnesota, which has less interstate travel generally than Indiana and more facilities for performing late abortions, suggest that the odds of having an abortion later than 8 weeks' gestation increased significantly for minors (relative to older women) when the law was imposed and then decreased significantly when the law was removed. These findings cast doubt upon those papers⁸ and fact sheets²⁰ that, on the basis of analysis of in-state abortions and the 12-week cutoff, claim that no delay results from parental involvement statutes.

Interstate travel and delay also share a complex link. In the case of Missouri, for instance, the estimated proportion of late abortions (using the 12-week definition) predicted by the last model described above shows that both before and after the law, out-of-state abortions occurred later than in-state abortions. But for minors, the proportion of late abortions fell with the law, while the proportion of early abortions rose. The most parsimonious explanation for this finding is that minors highly motivated to circumvent the law traveled to another state for early abortions. A strict judicial climate governing waiver petitions in Missouri¹⁶ may discourage minors from going to court in the first place.

Alternative Explanations

There are several ways to explain findings that in-state abortions fell in response to parental involvement laws while birthrates did not rise. First, more minors may have avoided pregnancy when faced with the laws. Yet calculations of the numbers of minors who would need to know about the laws beforehand and change their behavior accordingly are inconsistent with the smaller numbers apparently aware of the laws, according to a series of focus groups conducted about abortion generally.²¹ Interstate travel may explain the result, as discussed above. Increases in illegal or undocumented abortion are also possible. Although difficult to study directly, age misrepresenta-

TABLE 5—Estimated Change in Outcome Measures for Women of Three Age Groups (Minors and Two Control Groups) during Period of Parental Involvement Law Relative to Period Immediately Prior to the Law^a

Outcome Measure	Minnesota		Missouri ^b		Indiana	
	% Change	z Ratio ^c	% Change	z Ratio ^c	% Change	z Ratio ^c
Birth rate						
<18	+0.9		+4.4		-9.2	
18-19	-0.4	0.750	+7.4**	2.900	-3.4***	4.692
20-24	+1.7	10.000	+2.7	1.625	-3.3***	6.300
In-state abortion rate						
<18	-26.0		-20.1		-16.9	
18-19	-7.8***	11.000	-8.2***	7.875	+9.2***	12.909
20-24	+4.4***	18.556	+2.8***	16.800	15.3***	18.000
In-state pregnancy rate						
<18	-9.1		-2.3		-10.6	
18-19	-1.6***	6.583	+3.3***	6.000	+0.1***	10.363
20-24	+1.7***	10.182	+2.1***	6.143	-0.6***	11.778
Odds of ending pregnancy by in-state abortion						
<18	-28.3		-23.6		-7.7	
18-19	-9.3***	9.400	-14.2***	5.421	+8.2***	8.231
20-24	+1.5***	15.818	+0.0***	15.882	+15.2***	12.318
Odds of traveling out of state for abortion						
<18	NA		+52.9		NA	
18-19	NA		+12.9***	8.758	NA	
20-24	NA		+18.2***	7.355	NA	
Odds of delaying abortion >12 weeks						
<18	NA		+10.1		NA	
18-19	NA		+12.7	0.719	NA	
20-24	NA		+17.5*	2.167	NA	
Odds of delay, in state, >12 weeks						
<18	-0.7		16.6		-28.4	
18-19	-6.5	1.200	3.9**	3.026	-50.0	1.671
20-24	-8.4*	1.761	21.7	1.229	-46.6	1.547
Odds of delay, out of state, >12 weeks						
<18	NA		-9.4		NA	
18-19	NA		34.6***	7.014	NA	
20-24	NA		-3.1***	0.353	NA	
Odds of delay, in state, >8 weeks						
<18	+9.5		NA		-5.4	
18-19	-3.2***	2.860	NA		-9.9	1.600
20-24	-2.2***	3.289	NA		-7.4	0.600

Note. NA = not available.

^aEstimates are percentage change in fitted values derived from legal period by age interaction coefficients from models that also include terms for time (linear and quadratic), age group, legal period, and legal period by time interactions.

^bOut-of-state abortions refer to abortions performed on Missouri residents in the states of Arkansas, Kansas, Nebraska, Oklahoma, and Tennessee. A small number of abortions performed in other states (not including Illinois) are included.

^cAbsolute z ratios of the original test statistics.

*Significantly different from change for minors at $P < .05$.

**Significantly different from change for minors at $P < .01$.

***Significantly different from change for minors at $P < .001$.

TABLE 6—Estimated Change in Outcome Measures for Minnesota Women of Three Age Groups (Minors and Two Control Groups) during Period after Parental Involvement Law Was Enjoined relative to Period Immediately prior to the Injunction^a

Outcome Measure	% Change	z Ratio
Birth rate		
<18	0.2	
18-19	-14.8***	7.235
20-24	-17.7***	12.214
In-state abortion rate		
<18	-4.4	
18-19	-15.5***	4.571
20-24	-7.5***	17.278
In-state pregnancy rate		
<18	-1.1	
18-19	-11.9***	2.846
20-24	-13.7**	2.182
Odds of ending pregnancy by in-state abortion		
<18	-3.8	
18-19	-5.2***	8.500
20-24	+10.2***	21.043
Odds of delay, in state, >12 weeks		
<18	-22.3	
18-19	-15.2	0.500
20-24	-5.7**	2.306
Odds of delay, in state, >8 weeks		
<18	-22.7	
18-19	+18.6	0.093
20-24	-0.3***	3.395

^aEstimates are percentage change in fitted values derived from legal period by age interaction coefficients from models that also include terms for time (linear and quadratic), age group of the woman, legal period, and legal period by time interactions.

**Significantly different from change for minors at $P < .01$.

***Significantly different from change for minors at $P < .001$.

tion, self-induced abortions, and physician misdocumenting have all historically occurred in response to government regulation of abortion. Changes in population

composition may also explain the results,²² as may concurrent changes in public policy. The conservative tides that sweep parental involvement laws into

effect may also bring stricter public funding laws, or changes in school sex education programs, for example. New policies may themselves reflect increasingly conservative social mores.

Conclusions

Birthrates for minors did not rise when parental involvement laws took

effect in Minnesota, Missouri, and Indiana, nor did they fall in Minnesota when that state's laws were lifted. In-state abortion rates for minors declined during periods of enforcement of parental involvement laws, although interstate travel increased for minors confronted with the law in states where this outcome could be investigated. The magnitude of this increase in travel is unclear, but it may be sufficient to offset drops in in-state abortions. During periods of the laws' enforcement in Minnesota and Indiana, the two states with data on gestational age at abortion, in-state abortions for minors were probably delayed into the second month of pregnancy, although probably not into the second trimester. □

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