



Preterm Birth and Abortion

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Evidence of a Link Between Previous Induced Abortions and Subsequent Preterm Births

The supporters of abortion-on-demand in the United States have always argued that abortion was a safe procedure. They have tended to limit their analysis of abortion complications to those that occur to the woman at the time of the abortion. They have refused to acknowledge the possibility of long-term negative effects from abortion. One of the long-term complications that might be caused by abortion is the possibility that the woman having an abortion is at increased risk for having a premature birth in a subsequent pregnancy.

The possible medical explanations for such an effect from abortion are well-known. For example, preterm births occur when the woman has an incompetent cervix from trauma¹⁶, which could include the trauma of abortion. "Birth before 32 weeks is ten times more likely with a diagnosis of incompetent cervix," wrote Barbara Luke.²¹ Pediatrician Dr Elliot Gersh included the following risk factor for cerebral palsy: "Incompetent cervix (premature dilation) leading to premature delivery."²² Other medical conditions leading to preterm births, that may be exacerbated by an abortion include: uterine adhesions¹⁶, infection^{16,18-19}, mental stress¹⁶, increased maternal age¹⁰, and substance abuse.

Although never discussed by abortion advocates or the mainstream press, there have been many studies done to obtain an answer to the question of whether or not preterm births may be linked to a previous abortion. Fifty-nine studies have shown a statistically significant increase in preterm birth or low birth weight after an induced abortion.

A normal delivery generally occurs at approximately 38 weeks after conception. A delivery is considered to be an Early Preterm Birth if it occurs at less than 32 weeks gestation. An Extremely Early Preterm Birth is one that occurs at less than 28 weeks gestation. It is also possible to identify these stressful deliveries by measuring the birth weight of the infants. Low Birth Weight is considered to be less than 2500 grams. Very Low Birth Weight is defined as less than 1500 grams.

The fifty-nine studies referenced below all found that there was a significant increased risk of preterm birth or low birth weight of babies in women who have had a previous induced abortion as compared to women with no previous induced abortion. Three of the studies examined the question as to whether a previous induced abortion caused an increased risk for extremely early preterm births. All three found an increased risk. Two of these studies were done in Australia (numbers 43 and 48 below). The one done in

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2005 (number 58 below) was the first European confirmation of the Australian studies.

Twenty of the studies examined the question as to whether the number of previous induced abortions a woman has will increase her risk of having a subsequent preterm birth. All of these studies found that this was the case. The more induced abortions a woman had, the higher her risk of subsequent preterm births. The twenty studies with this finding are listed below as numbers 8, 9, 11, 25, 29, 32, 34, 35, 38, 39, 41, 43, 47, 48, 49, 50, 51, 54, 57, and 58. They are identified in the list with a "+".

List of 59 Studies Finding a Significant Increased Risk of Preterm Delivery as a Result of Induced Abortion

1960s

- 1 Barsy G, Sarkany J. Impact of induced abortion on the birth rate and infant mortality. *Demografia* 1963;6:427-467.
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1970s

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- +9 Bognar Z, Czeizel A. Mortality and Morbidity Associated with Legal Abortions in Hungary, 1960-1973. *AJPH* 1976;66:568-575.
- 10 Grindel B, Lubinski H, Voigt M. Induced abortion in primigravidae and subsequent pregnancy, with particular attention of underweight. *Zentralbl Gynaekol* 1979;101:1009-1114.
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- 18 Lean TH, Hogue CJR, Wood J. Low birth weight after induced abortion in Singapore, Presented at the 105th Annual Meeting of the American Public Health Association, Washington DC, Oct. 31, 1977.
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- 21 Czeizel A, Bognar Z, Tusnady G, et al. Changes in mean birth weight and proportion of low-weight births in Hungary. *Br J Prev Soc Med* 1970;24:146-153.
- 22 Dziewulska W. Abortion in the past versus the fate of the subsequent pregnancy. State of the newborn. *Ginekol Pol* 1973;44:1143-1148 [Poland].

1980s

- 23 Zwahr C, Voigt M, Kunz L, et al. Relationships between interruption abortion, and premature birth and low birth weight. *Zentralbl Gynaekol* 1980;102: 738-747.
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- +29 Berkowitz GS. An Epidemiologic Study of Preterm Delivery. *American J Epidemiology* 1981;113:81-92.
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- 31 Schoenbaum LS, Monson RR. No association between coffee consumption and adverse outcomes of pregnancy. *NEJM* 1982;306:141-145
- +32 Puyenbroek J, Stolte L. The relationship between spontaneous and induced abortions and the occurrence of second-trimester abortion in subsequent pregnancies. *Eur J Obstet Gynecol Reprod Biol* 1983;14:299-309 [this is the only study in this complete list that uses second-trimester miscarriage as a surrogate for PTB].
- 33 Pickering RM, Forbes J. Risk of preterm delivery and small-for-gestational age infants following abortion: a population study. *British J Obstetrics and Gynecology* 1985;92:1106-1112.
- +34 Lumley J. Very low birth-weight (less than 1500g) and previous induced abortion: Victoria 1982-1983. *Aust NZ J Obstet Gynecol* 1986;26:268-272.
- +35 Shiono PH, Lebanoff MA. Ethnic Differences and Very Preterm Delivery. *Am J Public Health* 1986;76:1317-1321.
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- 37 Seidman DS, Ever-Hadani P, Slater PE, Harlap S, et al. Child-bearing after induced abortion: reassessment of risk. *J Epidemiology Community Health* 1988;42:294-298.
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- 40 Pickering RM, Deeks JJ. Risks of Delivery during 20th to the 36th Week of Gestation. *Intl J Epidemiology* 1991;20:456-466.
- +41*Zhang J, Savitz DA. Preterm Birth Subtypes among Blacks and Whites. *Epidemiology* 1992;3:428-433.
- 42*Michielutte R, Ernest JM, Moore ML, Meis PJ, Sharp PC, Wells HB, Buescher PA. A Comparison of Risk Assessment Models for Term and Preterm Low Birthweight. *Preventive Medicine* 1992;21:98-109.
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- 44 Guinn D, Goldenberg RL, Hauth JC, Andrews WA et al. Risk factors for the development of preterm premature rupture of membranes after arrest of preterm labor. *AJOG* 1995;173(4):1310-1315.
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- 53 Foix-L'HelSIA's and Blondel B. Changes in risk factors of preterm delivery in France between 1981 and 1995. *Paediatric and Perinatal Epidemiology*. Oct 2000;14(4):314-323.

- +54 Henriët L, Kaminski M. Impact of induced abortions on subsequent pregnancy outcome: the 1995 French national perinatal survey. *British J Obstetrics Gynaecology* 2001;108:1036-1042.
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- 56 Reime B, Schuecking BA, Wenzlaff P. Perinatal outcomes of teenage pregnancies according to gravidity and obstetric history. *Annals of Epidemiology* 2004;14(8):619-619 [German subjects] http://www.sciencedirect.com/science?_ob=3DGatewayURL&_method=3DcitationSearch&_uokey=3DB6T44-4D8V8F5-2R&_origin=3DSDEMFRASCI&_version=3D1&md5=3De73601c4adf512cbb49d79b556183ab7
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- before 28 week's gestation for women with prior induced abortion.³ Another recent European study in 2004 replicated this finding.⁴
- In the US, the low birth weight delivery rate (infants born under 2500 grams) in 2002 increased to 7.8% from a previous rate of 6.8% in 1985.² This is the highest low birth weight rate in over 30 years.² Rooney and Calhoun performed an extensive review of 49 studies in 2003 of induced abortion as a risk factor for preterm delivery and found higher relative risks were demonstrated for preterm delivery occurring at gestations less than 31 weeks after induced abortion when compared to those deliveries occurring after 32 weeks.⁵ The 2004 EUROPOP study from Europe involving 60 maternity units in 10 countries found a 34% increase in early preterm infant deliveries in patients with prior induced abortions.⁴ (See Table 1 for a summary of the five most recent representative studies linking induced abortion and preterm birth.)

Discussion of Studies Finding a Link between Induced Abortion and Subsequent Preterm Deliveries

A recently published large study of French women with preterm births found that an increased risk of birth prior to 33 weeks occurred when women had a history of induced abortion.³ The key findings were as follows: 50% higher possibility of birth before 33 weeks for women with one previous induced abortion; 160% higher possibility of birth before 33 weeks for women with more than one previous induced abortion; and a 70% higher possibility of birth

Year Published	Year data collected	Author	Country	Details	OR One Induced Abortion	OR Two or more Induced Abortions
2004	1994-1997	Ancel ⁴	Europe (10 European countries)	Unmatched case control	1.34(1.08,1.68)	1.82(1.34,2.49)
2001	1995	Henriët ⁰	France	Same very early and med. Early pt births	1.3 (1.0,1.6) ^A	1.9 (1.3,2.9)
2000	Up to 1994 1980-1994	Zhou ⁹	Denmark	Low birth weight <2500 g	1.9 (1.6,2.3)	1.9 (1.3,2.7)
1998	1994	Martius ⁷	Bavaria	Did not restrict controls to primiparous preterm patients	2.5 (1.95,3.24)	5.2 (3.52,8.96)
1998	1983-1992	Lumley ⁸	Australia	Controlled for no prior delivery	EPB 1.7 (1.2,1.9) ^B XPB 1.6 (1.3,1.9)	EPB 1.8 (1.2,2.5) ^B XPB 3.0 (2.2,4.2)

Table 1: Five Recent, Representative Key Studies Linking Induced Abortion and Preterm Birth¹

^A 1.3 OR (95% CI 1.0-1.7) all numbers are noted in this fashion

^B Numerical relative risk instead of odds ratios are estimates from graphs

Complications Caused by Preterm Births

It appears to be clear that induced abortions are most likely a causative factor in subsequent preterm deliveries, deliveries that are generally of babies that the parents want to have. Preterm delivery is an important factor in the death rates of newborn children. It also contributes to the development of disabilities, including cerebral palsy. Babies born prematurely always require extensive hospital care and rehabilitation. Modern hospital technologies have evolved to be extremely effective in helping these babies, but at much greater cost than for babies born at term.

Preterm delivery continues to be a major cost factor in all health care dollars spent. Recent comprehensive statistics on preterm birth in the United States found the rate of preterm birth less than 37 weeks gestation increased again to 12.1% in 2002.¹ The most severe neonatal morbidity and mortality includes those neonates from 24 - 28 weeks gestation. Of those neonates born at these extremely premature ages, 41% did not survive to one year.¹ This is in contrast to the 5% death rate at one year for those preterm deliveries at 29 - 31 weeks gestation and the 1% death rate at one year for babies delivered later than 32 weeks gestation.²

St John, et al, in 2000, using the National March of Dimes delivery database on preterm live-born infants (which included 33, 516 preterm infants from the year 2000), found over \$10.2 billion was spent on neonatal care with 57%, or \$6 billion, providing care for infants delivered at less than 37 weeks.⁶ Neonates delivered between 24 - 28 weeks gestation cost over \$1.6 billion in 2000. The mean hospital cost per survivor ranged from a high of \$145,892 at 24 weeks gestation to \$63,714 at 28 weeks gestation.⁶

Estimating the Costs of Premature Delivery Caused by Induced Abortion

The purpose of this study was to estimate the costs that induced abortion contributed to the overall health care

expenses for babies born prematurely in the United States. Not all premature births are due to abortion, but those that are due to previous abortions are theoretically preventable. Having an induced abortion is an elective procedure. If the costs of having an abortion outweigh the benefits, this would be a factor in calling for a reduction in abortion numbers in the United States.

Fifty-nine studies in the English language were reviewed for preterm birth and links to abortion.¹ From this review, five of the most recent, representative studies with an association between induced abortion and preterm birth were selected. (See Table 1.) The total number of births in the United States from 2002 (the latest numbers currently available at the manuscript's writing) included 4,021,726 births.² Of this number, 12.1% or 486,629 were early preterm births (24 - 31 weeks) and 1.46% or 58,717 were very low birth weight infants (less than 1500 grams).

The total number of early preterm births due to induced abortions for 2002 were estimated using the following assumptions: 1) the birth rates and the survivorship rates for each week for early preterm births less than 32 weeks in the 2002 United States delivery data approximates those of the 2000 study by St John, et al. The data used in this study are from the 1989-1992 University of Alabama-Birmingham and neonatal survivorship data and the 1999 March of Dimes database, and 2) the neonatal survivorship rates would certainly not be lower than the ones we used in the 2002 data. (See Table 2.)

The risk of preterm birth attributable to a single elective abortion prior to first delivery was calculated by estimating the avoidable preterm birth risk due to prior induced abortion with the prevalence of prior induced abortion among women delivering their first baby. Five large recent international studies were used, which showed an association of prior induced abortions to preterm delivery.^{5,7-10} (See Table 1.) All of the studies found a statistically significant increased risk of preterm birth

before 32 weeks for women undergoing at least one first trimester abortion.^{7,10-13} Women undergoing two or more abortions had an even larger risk of preterm birth.^{4,7-10}

In 2003 the Alan Guttmacher Institute estimated that 1 in 3 women born in the U.S. would have an induced abortion in their lifetime. Prior to 2003 almost all abortions were done surgically.¹¹ Therefore, it was assumed that all the abortions were surgical. The calculation, which uses this Guttmacher abortion data, estimates that approximately 20% of women delivering a newborn have had a prior induced abortion. We used a risk model termed "Calhoun-Shadigian-Rooney or CSR" that is very close to that of Martius, et al.⁷ Combining the "CSR" relative risks with the 20% induced abortion prevalence among delivering women yields the figure of 31.5% for our attributable risk for preterm birth due to a prior abortion.

Therefore, 31.5% of preterm deliveries may be attributed to prior early elective surgically induced abortions. Of the 12,996 preterm babies who have died, 31.5% can be attributed to induced abortion. Thus, the "excess" neonatal death toll due to induced abortion is 4,094 per year. (See Table 3.)

Finally, excess cerebral palsy cases attributable to very low birth weight deliveries due to induced abortion were calculated by using the total U.S. births from 2002. Most very low birth weight newborns result from deliveries occurring below 30 weeks gestation. We used the 31.5% attributable risk applied to the total number of very low birth weight newborns (58,717) delivered in the United States. This resulted in an excess of 18,496 very low birth rate infants due to prior induced abortions. (See Table 3.)

Approximately 14,426 of these very low birth weight neonates will survive to discharge. Escobar, et al, in his meta-analysis reported a 7.7% cerebral palsy rate in very low birth weight newborns.¹² This 7.7% rate of cerebral palsy per very low birth weight neonates was used in calculating the excess cases of

cerebral palsy. This results in the conservative calculation of 1,096 excess US cerebral palsy cases, which is likely an underestimation of the impact of induced abortion on the incidence of cerebral palsy cases. (See Table 3.)

Estimated Costs in Dollars and Lives Lost Due to Induced Abortion

Using the dollar costs per surviving infant from the 2000 March of Dimes database in the St John, 2000, et al study⁶, the total amount spent on neonates delivered for each week of gestational age was calculated. By summing each individual gestational weeks' costs, it was possible to estimate the total cost of care for those neonates who survived to discharge alive or died prior to discharge at less than 32 weeks gestation. (See Table 4 for details of calculations.) The 2002 costs for inflation from 2000 were adjusted by the average inflation rates for the intervening years of 2001 (2.83%) and 2002 (1.59%).¹³ After adjusting for inflation, the total hospital costs for surviving neonates delivered at less than 32 weeks gestation in 2002 tops \$3.4 Billion per year. (See Table 4.) Using the previously noted induced abortion contribution of 31.5%, the attributable, cost-consequence contribution to initial neonatal hospital costs by induced abortion is 31.5% of the \$3.4 billion or \$1.1 billion (in 2002 dollars) per year in the United States.

Applying the 2000 dollar costs per non-surviving infant from St John, 2000, et al, the total amount spent on the neonates dying for each week of gestational age is calculated by summing the individual weeks' costs. (See Table 4.) The 2002 costs for inflation from 2000 were adjusted by the average inflation rates for the intervening years of 2001 (2.83%) and 2002 (1.59%).¹³ The total hospital costs for the infants with an early preterm birth, who did not survive in 2002 tops \$353 million. (See Table 4 for details of calculations.) Using the noted induced abortion contribution, as calculated above, the attributable, cost-consequence contribution to neonatal hospital costs by induced

abortion due to preterm birth for non-surviving infants is 31.5% of the \$349 million or \$112 million.

Therefore, the total initial financial consequence of induced abortion attributable to premature deliveries (surviving and non-surviving) prior to 32 weeks is over \$1.2 billion in the United States per year.

In addition to financial costs, there were 4,094 (31.5% X 12,996) excess deaths due to early preterm births caused by prior induced abortions. There were 58,717 very low birth weight newborns in 2002.² We approximate that 78% of such very low birth weight newborns survive the neonatal period. Babies born at very low birth weights due to induced abortions totaled 18,496 (31.5% X 58,717); and 14,427 (78% X 18,496) of them survived the neonatal period. We estimate that there were 1,096 excess cases of cerebral palsy in the very low birth weight group due to induced abortions.

In brief, following is a condensed list of the dollar and human estimates of the yearly short term costs due to early preterm births caused by abortion:

- Hospital Dollar Cost: \$1.2 Billion (in 2002 dollars) per year
- \$1.1 Billion to care for surviving preterm infants and
- \$.1 Billion to care for non-surviving preterm infants
- 2. Excess Deaths: 4094 babies
- 3. Excess Cerebral Palsy cases: 1096 babies

Implications of the Costs to Society Due to Damage from Induced Abortion

Until recently, little has been written about induced abortion as a public health issue.^{14,15} The recent publication of two summaries of salient articles raises concerns about induced abortion and preterm birth adding a new dimension to the discussion.^{5,15} It should be noted that this study does not include all the excess obstetrical costs, emotional costs to families, and the long-term costs of disabled preterm infants.

The increase in hospital expenses due to abortion raises the national neonatal hospital expenditure by a

total of over \$1.2 billion [living (\$1.1 billion) and non-living (\$112 million)] and, theoretically this expense is avoidable. However, this is only the immediate expense for these children and the additional expenses in caring for these children will fall on the families. All women, especially those facing a crisis pregnancy, deserve to be informed of the substantial impact of an induced abortion that the current pregnancy has on the next pregnancy and the entire family. The overwhelming evidence that she may deliver before 32 weeks will substantially impact her cost of raising children, particularly those children who may have conditions such as cerebral palsy and other conditions related to preterm birth. The cost impact for a particular woman, if she does deliver before 32 weeks, varies by the week of delivery, but ranges from \$27,000-\$145,000. Informed consent prior to elective abortion must include the above information and should stratify the risk of one previous induced abortion and multiple induced abortions.

It should be noted that the risk for cerebral palsy has been reported to increase by some 38 times.¹² This translates into one-half of the neurological problems in children that includes severe or significant developmental delay.²³ These problems can be prevented by eliminating abortions. Given that one-half of the neurological problems could be prevented, it is astonishing that there is not more call for limitations on abortion.

The liability crisis, fueled in part by the brain-damaged infant, has become a major issue in obstetrical practice.²⁴ With the median damage award for medical negligence at birth of over \$2 million in the years 1994-2000²⁵ and the cost for a "brain damaged" infant substantially higher, averaging over \$1 million (with one recent case awarded \$100 million), should make all obstetricians and abortion providers take notice.²⁶ A patient may now claim, that if they were not informed of the increased risk of preterm delivery by a physician performing an induced abortion,

they may recover monetary damages for such negligence.²⁷

Even a modest effect attributable to induced abortion leads to significant cost-consequences in initial neonatal hospitalizations. Women, the public and public health officials must be made aware of the huge costs (some \$1.2 billion a year in the United States) that even an increase of 31.5% of the risk of early preterm birth will have on initial neonatal care. A careful history of induced abortion must be part of every new pregnant patient encounter in any setting. Enhanced surveillance and counseling of increased risk for preterm birth ought to be discussed with women with a history of induced abortion, in preconception visits and/or early prenatal visits. Importantly, these precautions will provide the prudent obstetrical practitioner with: 1) an opportunity to alter a woman's prenatal care, given their induced abortion history, 2) a malpractice defense for a subsequent preterm

birth, since the increased risk came with the induced abortion, not in the obstetrical care, 3) allow for the compilation of national guidelines to manage pregnant women who have had a prior induced abortion, 4) allow for the construction and execution of new studies to improve the perinatal outcome of preterm birth specifically attributable to induced abortion.

Using the available information regarding induced abortion and initial hospital costs in the United States, over \$1.3 billion in excess initial hospital costs due to preterm delivery are attributable to induced abortion.¹ The calculated initial neonatal hospital costs of over \$1.3 billion do not reflect the subsequent significant lifetime costs of the increased morbidity of early preterm birth, including: cerebral palsy, blindness, deafness, and learning disabilities. This discussion also does not address other maternal psychological, emotional, or medical costs associated with induced

abortion. These costs are beyond the scope of this discussion. Further studies and analysis of the data relative to the attributable risk of preterm birth as a consequence of induced abortion and induced abortion's significant impact on public health costs will be required. Many women and their families, who experienced a previous crisis pregnancy ending in induced abortion, unnecessarily bear the burden for their lifetimes with the birth of a handicapped child. Armed with newer epidemiological studies demonstrating an association between prior induced abortion and preterm birth before 32 weeks, abortion and obstetrical providers necessarily need to carefully re-design informed consent forms (if not already done) for both induced abortion and prenatal care and delivery, and consider the medical and liability consequences of induced abortion more carefully than ever.



*Gestational Age (weeks)	Live birth Rates (%)	Survival Rates (%)	# Survivors	# Non-survivors
24	0.087	43	1,504	1,994
25	0.137	53	2,920	2,590
26	0.152	67	4,096	2,017
27	0.221	73	6,488	2,400
28	0.209	81	6,808	1,597
29	0.245	91	8,966	887
30	0.364	94	13,761	878
31	0.394	96	15,212	633
Total			59,755	12,996

Table 2: Summary of early preterm births due to induced abortion from 24-28 weeks and 29-32 weeks gestation¹

(Assumes 4,021,726 births from: Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Munson ML. Births: Final data for 2002. National Vital Statistics Reports; Vol 52, No 10. Hyattsville, MD: National Center for Health Statistics; 2003.¹)

^{*}After St John EB, Nelson KG, Cliver SP, Bishnoi RR, Goldenberg RL. Cost of neonatal care according to gestational age at birth and survival status. Am J Obstet Gynecol 2000; 182:170-175²⁸.

Table 3: Excess early preterm births and very low birth weight costs (dollars and human) due to prior induced abortions in the US per year in 2002 dollars

22,917	Excess Early Preterm Births (birth less than 32 weeks gestation)
4,094	Excess Deaths of Newborns with Early Preterm Births
18,495	Excess Cases of Newborns with Very Low Birth Weight
14,427	Excess Cases of Surviving Newborns with Very Low Birth Weights
1,096	Excess Cases of Newborns with Very Low Birth Weights with Cerebral Palsy
\$1.2 Billion	Excess Initial Neonatal Hospital Costs for Early Preterm Births per year in US

*Gestational Age (weeks)	Live Birth (%)	Survival (%)	Cost per Infant		Population Cost (Millions \$ US)		% both
			Survivors	Non-survivors	Survivors	Non-survivors	
24	0.087	43	\$145,892	\$20,597	\$219	\$41	2.8
25	0.137	53	\$121,181	\$22,683	\$354	\$59	4.2
26	0.152	67	\$99,362	\$24,770	\$407	\$50	4.4
27	0.221	73	\$80,264	\$26,856	\$521	\$64	6.0
28	0.209	81	\$63,714	\$28,942	\$434	\$46	4.5
Total Cost					\$1.94 billion	\$260	
Inflation Adjusted (2001-02)					\$2.02 billion	\$272	
Abortion adjustment(31.5% of total)					\$636	\$86	
29	0.245	91	\$49,546	\$31,028	\$444	\$27	4.7
30	0.364	94	\$37,569	\$33,114	\$517	\$29	5.5
31	0.394	96	\$27,629	\$35,200	\$420	\$22	4.3
Total Cost					\$1.4 billion	\$78	
Inflation adjusted (2001-02)					\$1.46 billion	\$81	
Abortion adjustment (31.5% of total)					\$460	\$26	

Table 4: Summary of costs of induced abortion from 24-28 weeks and 29-32 weeks gestation¹

(Assumes 4,021,726 births from: Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Munson ML. Births: Final data for 2002. National Vital Statistics Reports; Vol 52, No 10. Hyattsville, MD: National Center for Health Statistics; 2003.²)

¹After St John EB, Nelson KG, Cliver SP, Bishnoi RR, Goldenberg RL. Cost of neonatal care according to gestational age at birth and survival status. *Am J Obstet Gynecol* 2000;182:170-175⁵.

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