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Is the introduction of anonymous delivery associated with a reduction of high neonaticide rates in Austria? A retrospective study

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Abstract

Objectives—To assess rates of neonaticide after the implementation of a preventative “anonymous delivery” law in mid-2001 in Austria. Women are allowed to access antenatal care and give birth in a hospital anonymously, without showing any ID and free of charge.

Design—Retrospective Study

Setting—A complete census of police-reported neonaticides was obtained from the police statistics of Austria, Sweden and Finland.

Population—All neonaticides reported to the police, 1991-2009.

Main outcome measures—Neonaticide rates pre- (1991-2001) and post- (2002-2009) anonymous delivery legislation per 100,000 births.

Methods—The Mann-Whitney U test for two independent samples was used to compare neonaticide rates during the pre-law period to the rates observed after the implementation of the new law for each country.

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Contribution to Authorship

Claudia Klier, Sabine Amon, Christian Fiala, Ghitta Weizmann, Hanna Putkonen, and Sandi Pruitt have substantially contributed to conception and design of the study.

Grylli Chryssa has analysed and interpreted the data.

All authors have contributed in drafting the article or revising it critically for important intellectual content. All authors have given final approval of the version to be published.

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Details of Ethics Approval

Ethical approval was granted in Austria by the Austrian Ethics Commission, the Department of Justice and the Medical University of Vienna.

Results—On average the rate of police-reported neonaticides was 7.2 per 100.000 births (SD=3.5, median=7.1) in Austria prior to passage of the law and 3.1 per 100.000 births (SD= 2.1; median= 2.6) after passage of the law. A significant decrease in neonaticide was observed in Austria after the implementation of anonymous delivery (Mann-Whitney U test $p=.017$). Whereas the Finnish and Swedish rates were lower than the Austrian rates before and after the implementation of the Austrian law, they remained unchanged over the study period.

Conclusion—Our data demonstrate a significant decrease in the number of police-reported neonaticides in Austria after the implementation of anonymous delivery. Even though underlying factors associated with neonaticide are complex, the findings could indicate an effect of anonymous delivery in the prevention of this crime.

Keywords

Anonymous birth; Anonymous delivery; Child/Abandonment/legislation&jurisprudence; Denial of pregnancy; Newborn; Neonaticide

Introduction

Neonaticide is one of the most perplexing, sad and utterly repugnant offences in modern society. It is defined as the homicide of a newborn within the first 24 h of life by its mother (1). A denied or concealed pregnancy, which occurs in approximately 1 in 475 pregnancies (2), followed by an unattended delivery outside a hospital, threatens the mother's health and the child's outcome (3). In some rare cases it leads to death of the child through neglect or more active methods of killing. Reported neonaticide rates in European countries vary and actual numbers are likely much higher because neonaticide represents a hidden crime. For example, hidden disposal of corpses and incorrect coroners' rulings of accidental death in some neonaticide cases contribute to undercounting of reported cases of neonaticide (4–6).

In Europe there are two primary preventive strategies for the phenomenon of neonaticide and child abandonment: “anonymous delivery” and so-called “baby hatches,” which are similar to safe haven laws in the US.

The anonymous delivery law, as enacted in some European countries, allows women to give birth in a hospital anonymously, and free of charge if she gives her child for adoption. Baby hatches are easily accessible incubators situated outside hospitals. The incubator signals the staff on call when a baby is placed inside. Similarly, safe haven laws in the US allow for the anonymous surrender of unwanted newborns at designated locations such as hospitals and fire stations, and were first implemented in the US in 1999 (1). In Austria, whether the baby is born anonymously in the hospital or put in a baby-hatch, it is immediately put under custody of the corresponding Austrian regional child welfare institution. The mother has several weeks during which she may re-claim custody. After that time, custody remains with the corresponding child welfare institution and the child is given for adoption.

Anonymous delivery was implemented in France during the French revolution on the 28th June 1793. This right was reenacted under Napoleon and a similar decree was again enacted on the 2nd September 1941 during World War II (8). Luxemburg followed in 1993, Italy in 1997, and Austria in 2001 (9).

The aim of this study is to evaluate the effect of the anonymous delivery law on the frequency of neonaticide and to compare rates of neonaticide to countries where there is a police register for neonaticides but there are neither anonymous delivery nor safe haven laws (Finland, Sweden). Given its high rate of neonaticides, Austria introduced anonymous delivery in 2001, followed by a public awareness campaign at the beginning of 2002 on TV

and in newspapers. Implementation of the law in 2001 represents a natural experiment, making it possible to compare the effects before and after the introduction of this measure.

Methods

In Austria neonaticide is a crime covered by a specific law (§79 StGB), therefore police statistics treat neonaticide cases separately from homicide cases.

...A mother, who kills her child during childbirth or as long as she was influenced by the process of giving birth, should be punished with one to five years of imprisonment...

Neonaticide is legally classified separately from infanticide in only a few European countries, including all countries participating in this study (Austria, Finland, and Sweden).

Based on Austrian neonaticide law and the corresponding police statistics, we were able to evaluate the effect of the anonymous delivery law implementation on the number of neonaticide cases reported to the police and compare these results to the reported neonaticide cases in countries without similar legislation.

Only countries that differentiate in their criminal law between neonaticide and infanticide are able to provide accurate data on neonaticide in their police registries. Therefore we contacted statistics departments of Austria, Sweden, Finland, Denmark, Norway, and the Netherlands, countries that make this distinction in their corresponding legislation and are known to have registers.

Only Austria, Finland and Sweden had or could supply police statistics on neonaticides and include in their statistics all neonaticides, which are reported to the police as a suspected neonaticide regardless of the result of later investigations. Police-reported cases of neonaticide during the period 1991-2009 in Austria, Finland and Sweden (10-12) were analysed in this study. Police statistics are publicly available (10-12) and ethical approval was provided by Medical University of Vienna.

Poisson Regression analysis was used to estimate the respective trends in the rates of neonaticide in all participating countries across the entire study period (1991-2009) as well as before and after the implementation of the law. Birth rates were drawn from national birth registries of each country (13-15).

The year 2001 was considered as a pre-law year because the law was implemented in the second half of 2001. The Mann-Whitney U test for two independent samples was used to compare neonaticide rates during the pre-law period (1991-2001) to the rates observed after the implementation of the new law (2002-2009) for each country. All reported *p* values are two-sided.

Sensitivity analysis was performed by comparing the neonaticide rates observed in 1994-2001 (8 years) to the rates observed in 2002-2009 (8 years). Furthermore, a correction was made for the neonaticide cases observed in 2007. During this year six neonaticide cases were reported. However, three of them were committed by the same perpetrator more than 30 years ago (1977-1980) and therefore sensitivity analysis included statistical comparisons of the pre law 1991-2001 to the 2002-2009 after law period with and without the adjusted rates for the year 2007.

Results

Police-reported neonaticide cases as well as rates for 1991-2009 in Austria, Sweden and Finland are presented in Figure 1 and Figure 2 respectively.

Poisson regression analysis for Sweden and Finland showed a minor downward trend over time ($B = -0.055$ [$p = .821$] and $B = -0.040$ [$p = .871$]) respectively. However this was not statistically significant. On the contrary, Austria experienced a significant reduction ($B = -0.578$ [$p = 0.009$]) in the police-reported neonaticide rate over the entire study period from 1991 to 2009.

The mean, median, and range for annual police-reported neonaticide rates for period 1 (1991-2001, before anonymous delivery was legal in Austria) and period 2 (2002-2009, when anonymous delivery was available in Austria) were calculated for all three countries (Table 1).

Comparison of period 1 and period 2 showed a significant decrease in the reported rates in Austria (Mann-Whitney U test [$U = 73$, $n_1 = 11$, $n_2 = 8$, $p = 0.017^*$ two-tailed test]) (Table 1). No significant change was found for Finland or Sweden.

Sensitivity analysis did not change the conclusions. A significant decrease in the neonaticide rates during the post law period (2002-2009) when compared to the 1994-2001 pre-law period was observed for Austria but not for Sweden or Finland (Table 2). In addition, adjusting the neonaticide rate for the year 2007 also gave similar results regarding the pre law (1991-2001 and 1994-2002) versus after law (2002-2009) neonaticide rate comparison (Mann-Whitney U test [$U = 76$, $n_1 = 11$, $n_2 = 8$, $p = 0.008^*$ two-tailed test and $U = 54$, $n_1 = 8$, $n_2 = 8$, $p = 0.02^*$ two-tailed test respectively]) (Table 2). Mean rates per period studied are presented in Table 3.

Discussion

The aim of this study was to evaluate the effectiveness of the new anonymous birth law by analysing police-reported neonaticides in Austria before and after law implementation. We also compared Austrian rates to neonaticide rates observed during the same period in Sweden and Finland, two countries without similar provisions.

Our data show that police-reported neonaticide cases and rates decreased significantly in Austria after implementation of the new law. In contrast, no such differences were observed in Sweden and Finland where a consistently low rate of police-reported neonaticides was observed throughout the study period. Importantly, there were no other known socioeconomic or policy changes in Austria, such as passage of abortion laws or changes regarding childbirth benefits that could be associated with the observed decrease. This, together with our results, provides evidence that this new law might have contributed to reductions in reported neonaticides. These results are important because shortly after the implementation of the anonymous delivery law, the awareness campaign was stopped, likely due to concerns that women would use the anonymity to avoid the more complicated process of conventional adoption. However, these concerns were not based on data or scientific evidence (16).

The fact that anonymous birth may reduce the risk of neonaticide was previously demonstrated by a clinical psychodynamic study in France, which inspired the French parliament to modify the anonymous birth law in 1990, 1996 and 2002 (17). Bonnets study revealed that the causes of neonaticide were primarily psychodynamic and not socioeconomic and that the process of a pregnancy can relocate the offender to her own traumatic

childhood and thus trigger negative associations with the fetus, resulting in neonaticide (3). On the other hand, there is concern that mothers who would abandon an infant in a hospital might represent a different group than neonaticidal mothers. But until now only Bonnets study (3) provides insight into the psychological dimensions of women who abandon their children, finding that these women demonstrated similar impulses to harm and kill their babies as the women who committed neonaticide.

One US study found the rate of infants killed or left to die by a parent to be 2.1 per 100,000 births per year (1985-2000), prior to enactment of a safe haven law in that state (18). Another study estimated the number of illegally abandoned and legally surrendered newborns (via safe havens) in the state of Texas based on newspapers stories during 1996-2006 (19). Texas was the first U.S. state to introduce safe haven laws (in June 1999) and this study found that the number of abandoned newborns did not decrease after the safe haven law was enacted (19). After passage of the law in Texas, 20.4% of all abandoned newborns were abandoned in safe havens (n=11); the others were abandoned illegally (n=43), often in garbage cans or public toilets. The author concluded that the new law was unlikely to have caused any harm but that it did not work as well as it was intended. She further states that awareness campaigns would be necessary to inform possible users, but that women affected by mental illness and denial of pregnancy would most likely not benefit from such measures. Another study on safe havens in the US reports that some states experienced a reduction in illegal newborn abandonment after passage of safe haven laws while others did not, and that overall, there is very limited data to accurately test the effectiveness of these laws (7). Nevertheless, as of 2003, 45 of 50 US states had enacted safe haven laws (7).

Baby hatches, a similar prevention effort to safe havens in the US, are used in Austria, Germany, Switzerland, Czech Republic, Hungary, Italy, Poland, Japan, Philippines, Pakistan and South Africa. In Austria there are 2-3 cases of baby hatch babies reported per year (20), whereas cases of anonymous birth are in the range of 30-40 cases a year (21). In Europe there are not adequate statistics to determine whether baby hatches result in changes in the numbers of either killed or abandoned newborns. Furthermore, the baby hatches have an inherent disadvantage: they do not provide adequate support for the woman. On the contrary, she is left on her own during pregnancy and most importantly during the potentially dangerous delivery. Only if she and the child both survive childbirth and provided that she is physically able to do so, may she then place the newborn in a baby hatch. Another problematic aspect is that anyone could place a newborn in a baby hatch, potentially without the consent of the mother. Finally, the baby might be the result of rape or incest and therefore investigation would be impossible with this approach.

At this moment we can only speculate about the possible mechanisms involved in the decline of neonaticides in Austria. Previous studies about women who have committed neonaticide or have abandoned their child have revealed the existence of an unwanted pregnancy and a resulting denial of that pregnancy (17). Many different reasons (e.g., inability to keep the baby in the present social or partner situation, incest, rape, domestic violence, traumatised childhood, family pressure, societal disapproval, etc.) may be involved (17). However most women want to give their child a chance to live, even if they cannot provide the necessary love and environment (17).

We believe that public awareness of the available options of anonymous antenatal care and delivery is fundamental. The anonymous delivery approach could break the dreadful chain of events that lead from despair and denial to unsafe birth and subsequently to abandonment or neonaticide. Notably, neonaticide represents a hidden crime meaning that the discovered

cases represent only the tip of the iceberg. Therefore it is reasonable to assume that the benefits we observed in our study might actually be of a much larger magnitude.

Strengths and limitations

All three countries in this study maintain a highly reliable police recording system for homicide crimes, including neonaticide.

Police statistics have advantages over court files in that they also include discovered corpses of neonates without necessitating evidence regarding the offender. This is very important as unidentified corpses represent a substantial amount (13-37%) of all reported neonaticides or abandonment cases (22-24). Notably, the most important limitation of police statistics is that there may be reported cases that are not neonaticides, or alternatively, our data may be missing some neonaticides. From 50 original cases in the Finnish police statistics, 18 (36%) went through complete court process and were rated as neonaticides. The others were not included and analysed in this study.

One further limitation of police statistics is that data are available in reports after a one-year delay. Neonaticide cases are always registered in the corresponding year of their recovery and not in the year during which they were actually committed. However, this limitation is minimised by the fact that our study extends over a 20 - year period.

Such over- or underestimation of the actual cases should not influence the differences in police reporting differentially between the pre- and post- law time periods.

While undiscovered neonaticides and illegally abandoned babies represent a considerable phenomenon, our study methods do not allow us to shed light on the extent of this problem. However, while not ideal, police statistics remain the only available method to assess the effect of the anonymous delivery law across different countries.

There might be confounders that we are unable to measure occurring over time or within the different countries that are not known to the authors that may account for our findings. However, to our knowledge the basic socioeconomic situation is very similar in all three countries, they are culturally not different except that the two Nordic countries are completely secular and Austria still has a strong influence of the Roman Catholic Church.

It is worth speculating why the Nordic countries have much lower neonaticide rates than Austria even after the intervention. Whether abortion laws influence neonaticide rates is not known. The abortion law in Austria has a lower gestational limit (12 weeks) and higher costs than in both Finland (up to 20 weeks under certain circumstances, such as young age or limited capacity to care for a child) and 18 weeks upon request in Sweden (25). This may be of importance when denial of pregnancy is taken into consideration as such denial may prevent women from reacting in a timely manner. However, Sweden (26) has twice as many abortions as Finland (27) but still has a similar rate of neonaticide; whereas Austria has approximately the same abortion rate (only estimated rates are available for Austria) as Sweden but it has a higher rate of neonaticide. When changes in socioeconomic circumstances occur, rates of neonaticides may change substantially. Permissive abortion laws and sex education in the 1970s have contributed to the decrease of numbers of neonaticides in Finland (22); in Serbia neonaticide rates declined following the Abortion Act in the 1960s (28). Lester found no changes in neonaticide rates after five states legalised abortion in 1970, this sentence is unclear (29). Further research is needed to understand the effect of abortion regulations, as well as other factors, on neonaticide rates and changes in these rates in the countries in our study.

It has been shown that there are complex underlying factors in neonaticide (30), and of course no simplistic approach and over interpretation of causality is possible.

Conclusion

Our data demonstrate a significant decrease in the number of police reported neonaticide cases in Austria following the implementation of the anonymous delivery law in mid-2001 and our findings are suggestive of a possible connection of these two events.

Experts in neonaticide favour prevention strategies such as safe havens or anonymous delivery (31) as mothers and infants of denied and concealed pregnancies have poorer health outcomes (32–34) but no definitive conclusions can yet be made regarding the effectiveness of these strategies. Interviewing women who make use of anonymous delivery would help to elucidate the circumstances, reasons, and mechanisms and subsequently may also give us insight into the ways of better preventing these neonaticides (3).

We would like to emphasise the fundamental role of public awareness. Only if potential users are aware of the anonymous delivery measure will they be able to use it as intended. We strongly believe that the use, design, and potential effects of public awareness campaigns should be explored in future research.

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Figure 1.
Neonaticide cases in Austria, Sweden and Finland, 1991 - 2009

Figure 2.
Neonaticide Rate in Austria, Sweden and Finland, 1991 - 2009

Table 1
Rates of police-reported neonaticide cases in austria, sweden and finland, 1991-2001 and 2002-2009

	AUSTRIA		SWEDEN		FINLAND	
	1991-2001	2002-2009	1991-2001	2002-2009	1991-2001	2002-2009
Cases Total	70	19	22	23	11	6
Cases Mean	6.4	2.4	2	2.9	1	0.8
<u>RATES</u>						
MEAN	7.2	3.1	1.8	2.8	1.6	1.3
SD	3.5	2.1	1.9	2.0	1.6	1.2
MEDIAN	7.1	2.6	1.1	2.4	1.5	1.7
RANGE	2.5-13.0	1.3-.9	0.0-6.5	0.0-5.9	0.0-3.5	0.0-3.3
Mann-W U-test two-tailed	U=73, p=.017*		U=57.5, p=.26,		U=46, p=.90	

Cases (total) represent the total number of neonaticide cases reported during the period under investigation

Cases (mean) represent the average number per year of neonaticide cases reported during the investigated period

Rates are expressed as neonaticide cases per 100,000 births

Table 2

Comparison of neonaticide rates in austria, sweden and finland observed during prelaw versus postlaw period

COUNTRY	TIME PERIOD	U	N1 N2	P
AUSTRIA	1991-2001 VS 2002-2009	73	N1=11, N2=8	0.17 *
AUSTRIA	1994-2001 VS 2002-2009	51	N1=8, N2=8	0.045 *
AUSTRIA	1991-2001 VS 2002-2009 [^]	76	N1=11, N2=8	0.008 *
AUSTRIA	1994-2001 VS 2002-2009 [^]	54	N1=8, N2=8	0.02 *
SWEDEN	1991-2001 VS 2002-2009	57.5	N1=11, N2=8	0.264
SWEDEN	1994-2001 VS 2002-2009	48.5	N1=8, N2=8	0.08
FINLAND	1991-2001 VS 2002-2009	57.5	N1=11, N2=8	0.87
FINLAND	1994-2001 VS 2002-2009	48.5	N1=8, N2=8	0.92

[^] Neonaticide rate observed during 2007 is adjusted Rates are expressed as cases/100000births MANN WHITNEY –U TEST

* p is significant, two-tailed test

Table 3

Neonaticide Rates in Austria, Sweden and Finland during Prelaw (1991-2001 and 1994-2001) and Postlaw Period (2002-2009)

COUNTRY	PERIOD	MEAN	STD ERROR OF THE MEAN
AUSTRIA	1991-2001	7.22	1.07
AUSTRIA	1994-2001	6.91	1.23
AUSTRIA	2002-2009	3.1	0.75
AUSTRIA	2002-2009 [^]	2.6	0.35
SWEDEN	1991-2001	1.81	0.58
SWEDEN	1994-2001	1.06	0.37
SWEDEN	2002-2009	2.8	0.72
FINLAND	1991-2001	1.63	0.5
FINLAND	1994-2001	1.49	0.66
FINLAND	2002-2009	1.27	0.42

[^] Neonaticide rate observed during 2007 is adjusted Rates are expressed as cases/100000births