Alcohol in the Family: How an Anti-alcohol Campaign Transformed Health, Marriage and Childbearing

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September 18, 2024

Abstract: How does a sustained, society-wide reduction in alcohol consumption affect family well-being? We analyze the effects of a major anti-alcohol campaign in the Soviet Union on mortality and family outcomes in the Russian republic. We exploit the differences in precampaign alcohol related mortality across Russia's regions to identify its causal effects. The 1985-1990 campaign reduced alcohol consumption and led to large reductions in male and female adult mortality in urban and rural areas. The mortality reductions were largest in the prime age groups (25-54) and for deaths due to alcohol-related causes, respiratory disease deaths and deaths due to external causes, such as homicides and suicides. We find a substantial decline in infant mortality among boys and girls, primarily due to a decrease in deaths due to respiratory diseases and external causes, such as choking. The probability of divorce increased and both first and higher parity fertility rates rose due to the campaign. A fall in abortion explains a rise in childbearing, in part, while maternal mortality due to abortions performed outside of a hospital fell significantly.

We would like to thank Brant Callaway, Andrew Goodman-Bacon, Yang Jiao, Chinhui Juhn, Jason Lindo and Erik Nesson for helpful discussions and seminar participants at Brandeis University, and the University of California, Irvine and conference participants at the Midwest Economic Association, NBER Summer Institute – Children, Society of Labor Economists and the Atlanta Workshop on Public Policy and Child Well-being.

Many developing and developed countries have high levels of alcohol consumption, and the per capita consumption levels among drinkers in most world regions has been rising since 2000 (WHO 2019).[1] In 2016, almost one billion individuals were heavy episodic drinkers, and alcohol use was responsible for 5.6 percent of worldwide deaths.[2] Alcohol consumption among adult women (in North America and Europe) has increased substantially and nearly eliminated the gender gap in alcohol consumption, while overall levels of consumption remain high (Slade et al. 2016, White 2020).[3] The whole society bears the costs of alcohol use that is associated with violent deaths and crimes, risky sexual behavior, and mortality (Carpenter and Dobkin 2011, Cawley and Ruhm 2011). To reduce these individual and societal costs, most countries implement policies to discourage the use of alcohol through taxes and restrictions on purchases of alcohol. Yet, there is a scarcity of direct causal evidence on the effect of a prolonged decline in alcohol consumption at the *societal* level on adult and infant mortality, or on potential effects on families' planning horizons affecting decisions of marriage formation, dissolution and childbearing.

The scarcity of previous evidence is due to the lack of abrupt and long-lasting declines in alcohol consumption among the entire population of a country. This study takes advantage of a

[1] Alcohol consumption in the United States has increased over the last 20 years, while deaths from excessive alcohol use rose by nearly 30 percent between 2016 and 2021.
[2] Heavy episodic drinking means consuming 60 or more grams of pure alcohol on at least one occasion at least once per month. Over 200 health conditions are linked to harmful alcohol use.
[3] White (2020) documents the shrinking gap in alcohol consumption between men and women in the United States for nearly a century, while Slade et al. (2016) systematically summarize studies from different countries (mainly from North America and Europe) and find shrinking gender gaps, where among cohorts born in the 1980s and later the gaps are nearly eliminated in both any drinking, or problematic drinking.

major, unanticipated, and prolonged anti-alcohol campaign that was implemented on June 1st, 1985 by Mikhail Gorbachev across the Soviet Union. The government controlled the production, sale and pricing of alcoholic beverages, which allowed it to swiftly implement a campaign that restricted the sale and production of alcohol, as well as raised alcohol prices. While the official end of the campaign was in October 1988, in practice it lasted through at least 1990 (Bhattacharya et al. 2013), because restarting state production took time and elevated prices lingered. The campaign led to an immediate drop in Russian alcohol consumption: recorded alcohol sales fell from 10.5 liters of pure alcohol per capita in 1984 to 8.8 liters in 1985 and to 5.2 liters in 1986 (Nemtsov 2011), and remained low at 5.6 liters in 1990.[4] The large and sustained decline in alcohol consumption is matched only by Federal Prohibition in the United States (1920-1933).[5]

We exploit variation in the precampaign age-standardized death rate (SDR) from alcohol related causes at the oblast-level (similar to a U.S. state) to estimate the campaign's causal effects and provide evidence that oblasts with higher SDRs experienced larger declines in alcohol consumption. We follow recommendations for continuous difference in differences designs in Callaway, Goodman-Bacon and Sant'Anna (2024a, 2024b) and separate regions into three groups:

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[4] Total alcohol consumption fell by less due to increased consumption of homemade alcohol *(samogon)*. Total estimated alcohol consumption fell from 14.6 liters per capita in 1984 to 13.3 liters in 1985 and to 10.8 liters in 1986.

[5] Average alcohol consumption is unavailable during state and Federal prohibition. Some rough estimates suggest that Prohibition reduced alcohol consumption to an estimated 30 percent of the pre-Prohibition level, before rebounding to 60 to 70 percent of that level within several years (Miron and Zwiebel 1991). About half of the population lived in areas that implemented state or county Prohibition before 1920. State prohibition reduced consumption of pure alcohol to an estimated 43 percent of the level of average (nationwide) per capita alcohol consumption in 1896-1900 (Edwards, Griffin and Howe 2015, LaVallee and Li 2011).

low-dose (comparison group) whose SDR is below the 20th percentile, medium-dose (first treatment group) whose SDR is above the 20th and below the 60th percentile and the high-dose regions (second treatment group) whose SDR is above the 60th percentile. We perform two regressions: where in the first we compare the medium-dose to the low-dose regions (estimating the lower bound for the average treatment on the treated parameter for medium-dose regions) and in the second we compare the high-dose to the low-dose regions (estimating the lower bound for the average treatment on the treated parameter for high-dose regions). We assemble oblast-level data for Russia from archival sources that have never been used before, as well as censuses and yearbooks, to examine crude death rates, crude marriage and divorce rates, the general fertility rate and the infant mortality rate from 1981 to 1990.[6]

We find that the campaign results in an *immediate* and *sustained* decline in death rates, with the largest declines in rural areas. Death rates declined by at least 3 percent in the high-dose regions in 1985 when the campaign has been in place for 7 months, and by at least 8 percent in 1986. The decline was similar among men and women and was sustained through 1990. The percent change in mortality rates in rural areas was at least twice that in urban areas which could be due to higher alcohol consumption and mortality from alcohol related causes in rural areas. Most ages (15 to 80) and causes of death experienced a decline in mortality. The largest declines

[6] The crude death rate is the number of deaths per 1,000 population; the crude marriage/divorce rate is the number of marriages/divorces per 1,000 population; the general fertility rate is the number of births per 1,000 women of childbearing age, and the infant mortality rate is the number of infant deaths per 1,000 live births.

occurred among deaths due to alcohol-related causes, infectious and respiratory diseases as well due to external causes such as homicides and suicides.

How do our findings compare to limited causal estimates using other policies that resulted in nationwide reductions in alcohol consumption? First, our decline in the crude death rate is consistent with Bhattacharya et al. (2013) who studied the same campaign but were unable to perform any heterogeneity analysis due to a lack of data. We collect new data and construct death rates in the years immediately preceding the campaign allowing the test for parallel pre-trends and construct death rates by sex, urban/rural, age and cause of death. Second, our findings are in line with Law and Marks (2020) who find that mortality declined during state Prohibition in the United States prior to 1920, but they do not examine it by gender, age or cause.[7] While, as in our context, state and federal Prohibition substantially lowered alcohol consumption, state Prohibition differed from the Soviet immediate implementation of the campaign, because it could take up to two years to enact state Prohibition laws (Blocker 2006, Law and Marks 2020). Finally, our findings are in line with Barron et al. (2022), but only for men, who find that a 5 week ban on alcohol in South Africa resulted in an immediate decline in deaths from unnatural causes among men, but not among women. We can estimate the immediate effects of a much more prolonged reduction in alcohol, while by design, Barron et al. (2022) can estimate very short-term effects against the backdrop of

[7] A larger literature on the effect of state and federal prohibition statutes has found ambiguous effects on mortality (Dills and Miron 2004, Livingston 2016, Miron 1999, and Owens 2011). Law and Marks (2020) argue that they overcome empirical challenges in prior work.

the COVID pandemic. Our paper is the first to document large declines in female mortality of a societal decline in alcohol consumption.

The substantial decline in mortality among women underscores the importance of studying infant and maternal mortality in this context which were mainly due declines in deaths due to respiratory and external (e.g. suffocation, choking) causes. The campaign led to similar declines in IMR among boys and girls. In high-dose regions the IMR declined by at least 8 percent already in 1985 and was sustained through 1989. Moreover, the campaign led maternal mortality to decline by at least 20 percent in high-dose regions, which was mainly due to abortions started outside a hospital setting. This substantial decline in infant mortality is consistent with the relatively high alcohol consumption in pregnancy among Russian women (Kotelnikova 2022)[8], a reduction of which could have increased breastfeeding and prenatal visits, as well as shift expenditures toward necessities and children's goods, as households spent less money on alcohol. We do not find evidence of changes in stillbirths and perinatal mortality suggesting that the decline in IMR was due to a decline in deaths among babies who were older than 7 days. Only two papers examined the effect of declines in alcohol consumption on infant mortality and have done so in the American Prohibition context. Jacks, Pendakur and Shigeoka (2021) exploit the staggered repeal of Federal Prohibition via county elections and find that counties that became wet experienced a 4 percent

[8] The estimates are from a national 1994 survey that states that 25.6 percent of pregnant women consumed alcohol in the last 30 days. Estimates from the 1980s are unavailable.

increase in the infant mortality rate (there are no estimates by sex or cause), and Law and Marks (2020) find insignificant effects of the staggered state Prohibition adoption laws prior to 1920. We contribute to these findings by studying a context with: (1) documented effects of alcohol consumption on women, (2) much lower infant mortality rates (IMR) and more modern medical care[9], and (3) availability of data by sex and cause.

Reductions in alcohol consumption have ambiguous theoretical effects on marriage formation, dissolution and childbearing. Marriages may rise if individuals' attractiveness on the marriage market improves, or shotgun weddings may fall if risky sexual behavior and conceptions go down (Dee 2001). Divorces may fall if the quality of marriages increases and domestic violence declines, or divorces may rise if the pool of 'marriageable' partners grows (McKinnish 2007), there is a mismatch of alcohol preferences within the couple or if domestic violence increases, as the campaign drove drinking from public spaces into the home (Treml 1987). Fertility may increase if miscarriages fall and conceptions rise, the quality of marriages rises, household income rises (Black et al. 2013, Kearney and Wilson 2018), and entry into marriage rises, which typically resulted in a birth of a child shortly after, in our context. However, fertility may decline if unplanned conceptions fall due to a decline in risky sexual behavior and domestic violence.

We provide the first causal evidence on the effect of alcohol consumption on marriage and divorce. The anti-alcohol campaign led to an immediate increase in the divorce rate, with larger increases in urban areas, but no change in the marriage rate. Divorce rates rose by at least 5 percent in high-dose regions in 1985 and by at least 10 percent in 1986, which was sustained through 1989.

We provide the first causal evidence of a nationwide reduction in alcohol consumption on

[9] The IMR in the U.S. was 60.0 at the end of Prohibition (Jacks et al. 2021), while the Russian IMR was 20.5 in 1984 (Table 1).

childbearing. We find an immediate increase in the general fertility rate in high-dose regions (number of births per 1,000 women of childbearing age), where it was at least 4 percent higher from 1986 to 1988 relative to before the campaign. The campaign led to an increase in first births, suggesting a shift in timing of these births, and an increase in higher parity births suggesting a rise in completed fertility. Finally, we find evidence that the rise in births is due to an immediate decline in abortions in 1985. The drop in abortions is also consistent with the decline in maternal deaths due to abortions.

This study is related to the literature on changing the minimum legal drinking age laws (MLDA) and on changes in the alcohol trading hour regulations. While the effects of these laws are clearly important, they either apply to a narrow segment of the population (teenagers), or only restrict when alcohol can be purchased, and are not directly comparable to a society-wide alcohol restriction. Moreover, subnational alcohol policies can be more readily avoided via cross-border purchases of alcohol, possibly amplifying negative externalities on society (Lovenheim and Slemrod 2010). A lower MLDA may increase risky sexual behavior (Carpenter 2005), while a lower MLDA or gaining legal access to alcohol is associated with higher alcohol-related mortality and non-fatal injuries, as well as increased crime and crime victimization (Carpenter and Dobkin 2011, 2017; Chalfin, Hansen and Ryley 2023). Alcohol trading hour restrictions lead to lower homicides, car accidents, and alcohol related hospitalizations (Biderman et al. 2010, Green et al. 2014, Marcus and Siedler 2015). Studies find mixed effects of changing the MLDA on teenage fertility (Dee 2001; Cintina 2015)[10]. Finally, a lower MLDA is associated with lower birthweight and a higher probability of premature birth (Fertig and Watson 2009; Barreca and Page 2015).

This paper provides a novel insight that a significant decrease in alcohol consumption can

[10] Dee (2001) finds that increases in MLDA reduces the Black teenage birth rate. Cintina (2015) finds that a decline in the MLDA leads to a lower probability of becoming pregnant among non-poor white women.

have far-reaching effects on family well-being in addition to its direct effects on health. Lower alcohol consumption resulted in family structure changes, which have implications for the well-being and outcomes of children, as well as a rise in births. Our findings are specific to our context, which was characterized by high levels of alcohol consumption and binge drinking, and of alcohol related deaths. However, these findings are relevant for countries today, as many grapple with excessive alcohol consumption and heavy episodic drinking, including numerous countries in Eastern and Western Europe, South America, Asia and southern Africa (WHO 2019).

I. Alcohol Consumption and the Anti-Alcohol Campaign in the Soviet Union

A. Alcohol Consumption in Russia

Alcohol consumption in the Soviet Union increased rapidly in the postwar period and had reached alarming levels by the early 1980s. Average official consumption of alcohol in Soviet Russia increased from 4.6 liters of pure alcohol per capita in 1960 to 8.3 and 10.5 liters in 1970 and 1980, respectively (Nemtsov 2011).[11] In the Russian republic, total alcohol consumption – including estimated consumption of homemade alcohol (*samogon*) – reached 14.6 liters per capita in 1984, one of the highest rates of alcohol consumption in Europe (Nemtsov 2000, 2011). Vodka and samogon comprised over 60 percent of total alcohol consumption, and a great deal of alcohol consumption took the form of binge drinking (Treml 1991)[12]. The high level and hazardous nature of alcohol consumption imposed enormous costs on Soviet society. Widespread public drunkenness and drunkenness on the job raised worries about absenteeism and reduced labor productivity (White 1996). Nearly three-quarters of all homicides and rapes were committed under

[11] Official alcohol consumption excludes homemade alcohol (*samogon*).

[12] Many countries today have a high share of spirits in alcohol consumption including Eastern European countries, and especially Japan, India, Thailand, and China. Similarly, many countries' share of drinkers who have had a heavy drinking session in the past 30 days is over 40 percent including South America (e.g. Brazil), Mexico, countries in the south part of Africa (e.g. South Africa), Asia (e.g. China and India), Australia, and western Europe (e.g. Germany, France and the U.K.) (WHO 2019).

the influence of alcohol in this period, and 80 percent of all road deaths were associated with alcohol consumption (White 1996).

Arguably the highest cost was the deterioration of the health of the population, reflected in decreasing life expectancy and rising mortality from alcohol-related causes that began in the mid-1960s (Dutton 1979). Excessive alcohol consumption is associated with high death rates due to external causes (accidents, drownings, homicides, suicides, poisonings) and also increases the risk of cardiovascular mortality.[13]

While most studies of alcohol consumption in Russia have focused on the health and mortality consequences of male drinking, alcohol consumption among women had also risen to troubling levels by the early 1980s. According to Soviet surveys, women comprised 4 percent of heavy drinkers in 1940, 8 percent in 1960 and 15 percent by the early 1980s (White 1996). The rate of fatal alcohol poisoning was extraordinarily high among men at 40.5 per 100,000 population in 1978-79 but was also extremely high among women at 9.4 per 100,000 population (Stickley et al. 2007), as compared to 0.20 per 100,00 population for men and women in the U.S. in the same year (CDC 2023). It is estimated that 90 percent of women were regular drinkers in the early 1980s and that drinking while pregnant as well as postnatally was common in this period (White 1996).

Although medical and public health professionals knew that drinking during pregnancy was harmful to the fetus and caused fetal alcohol syndrome (see, for example, Granat and Zangieva 1987), it was not until 2018 that the Russian Ministry of Health issued guidelines recommending complete abstinence from alcohol during pregnancy (Kotelnikova 2022). Estimates from a

[13] A study of adult male deaths in the Urals confirmed that cardiovascular deaths are strongly associated with periods of heavy drinking among adult men in Russia (Shkolnikov et al. 2001), and a study of Siberian men found an increased risk of cardiovascular and external cause mortality among frequent heavy drinkers (Malyutina et al. 2002). An analysis of nearly 25,000 autopsies conducted in Barnaul (Siberia) between 1990-2004 indicated that 21 per cent of all autopsied adult male deaths attributed to circulatory diseases had lethal or near-lethal levels of ethanol concentration in the blood (Zaridze et al. 2009b).

nationally representative sample of Russian women in 1994 indicated that 25.6 percent of pregnant women had consumed alcohol in the last 30 days, compared with 12.8 percent of U.S. women in a 1999 survey (Kristjanson et al. 2007). With relatively high levels of female alcohol consumption, alcohol control policies in Russia would be predicted to affect the health of women and infants, and potentially other aspects of family well-being such as marital stability.

B. The Anti-Alcohol Campaign in the Soviet Union[14]

The anti-alcohol campaign was announced in a decree of the Central Committee of the Communist Party published on May 17, 1985 and enforced beginning on June 1, 1985.[15] The primary goals of the campaign were to reduce alcohol consumption in the country and to suppress the production and sale of samogon (Nemtsov 1998). The state's monopoly on the production, sale, pricing and foreign trade of alcoholic beverages enabled it to enforce the measures detailed in the decree, which included significant restrictions on the sale and production of alcohol. Sales of alcohol in retail stores were restricted to the hours of 2 and 7 pm, restaurants were prohibited from selling hard liquor, and alcohol sales were banned near schools, factories, hospitals and airports. Many breweries were closed and the acreage of wine crops was reduced by 30 percent. The minimum legal drinking age was raised from 18 to 21. In addition, penalties for public drunkenness, alcohol consumption on the job, drunk driving, and the production and selling of samogon were sharply increased. Prices of alcoholic beverages were increased by 25 percent in August 1985 and by an additional 20 percent in August 1986 (Treml 1987, 1991), raising the cost of a ½ liter of vodka to roughly a day's pay for the average Soviet worker (Balan-Cohen 2008).

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[14] Comprehensive accounts of the anti-alcohol campaign are provided in Balan-Cohen 2008, Bhattacharya, Gathmann and Miller 2013, Kueng and Yakovlev 2021, Nemtsov 1998, Nemtsov 2011, Reitan 2001, Tarschys 1993 and White 1996.

[15] CPSU Central Committee's resolution "On Measures to Overcome Drunkenness and Alcoholism." The resolution was adopted in the Politburo on May 7, 1985. The first public information about the campaign appeared in a *Pravda* report on a Politburo meeting that was published on April 5, 1985 (White 1996).

The production of non-alcoholic beverages was increased, and the decree also promised to increase recreational activities and venues and expand treatment for alcoholism.

Campaign implementation varied across Russia's regions and over time. Initially strongly enforced and widely promoted through a nationwide propaganda campaign, key campaign components -- such as restricted hours and locations of alcohol sales – were implemented immediately and led to lengthy queues at alcohol stores. Other campaign components, such as increased production of non-alcoholic beverages, construction of recreational facilities and the expansion of alcoholism treatment facilities, took longer to implement with uneven results (White 1996). The application of fines and penalties for violation of campaign regulations and public drunkenness varied widely across oblasts; accounts from regional newspapers describe open violations of campaign regulations in some regions and stringent adherence and enforcement of the regulations in other regions (White 1996). While there are few patterns in campaign implementation across regions,[16] White (1996) argues that urban areas were more closely monitored for adherence than rural areas, and Keung and Yakovlev (2021) state that the ban on samogon production was more easily enforced in urban areas than in rural areas, due to the distinctive odor associated with its production and the equipment needed to produce it.

The exact date of the end of the anti-alcohol campaign is unclear. It was unpopular and the loss of alcohol revenues -- which comprised 12 to 15 percent of state government revenue prior to the campaign – became increasingly problematic (Treml 1982; Tarschys 1993). The first sign of official deceleration was the ending of criminal liability for samogon consumption in July 1987. State production of alcohol began increasing in October 1988 (Tarschys 1993), and the CCCPSU passed a resolution in October 1988 that the campaign legislation would no longer be enforced

[16] For example, The Soviet Minister of Justice stated that "every place, town and even enterprise implement[ed] the legislation in its own random way" (Balan-Cohen 2008).

(Nemtsov 1998). Reitan (2001) argues that the core period of the campaign was 1985 to 1987, followed by a de-escalation in 1987-1988. Others argue that, due to the time required to increase alcohol production and the continued high prices of alcohol, the effects of the campaign persisted into 1990 and 1991 (Bhattacharya et al. 2013). We end our analysis in1990, because we are still in the process of collecting data from 1991 onwards.

The campaign led to an immediate, large decline in the production and official sales of alcohol in the Soviet Union. Within the first 12 months of the campaign, state production of vodka and other hard liquors fell by 30 to 40 percent in the Soviet Union (Segal 1990). Consumption of registered alcohol in liters of pure alcohol per capita fell from 10.5 liters in Russia in 1984 to 3.9 liters per capita in 1987 (Nemtsov 2011). Authorities were less successful at suppressing samogon production, especially as the campaign wore on, and the consumption of samogon increased from an estimated 4.2 liters of pure alcohol per capita in 1984 to 7.1 liters in 1987 in Russia (Nemtsov 2011). As a result, total estimated alcohol consumption fell by 3.7 liters in those years, a decline of 25 percent from the 1984 level. This is one of the largest society-wide declines in alcohol consumption in modern times, outside of Prohibition, wars and other disasters.

C. The Demographic Context: Marriage, Divorce, Fertility and Infant Mortality in Russia

The anti-alcohol campaign took place against a backdrop of relatively low fertility and traditional attitudes towards marriage and childbearing in Russia. In contrast to European countries, the average age at first marriage had been falling since 1960 and was only 22.4 for women and 24.2 for men by 1980 (Avdeev and Monnier 2000). Marriage was quickly followed by a first birth, which on average occurred about one year after marriage (Zakharov 2008). The total fertility rate was slightly below the replacement level of fertility at 1.90 births per woman in 1980 (Goskomstat 1998); in our data the general fertility rate (births per 1000 women ages 15 to

44) was 79.9 in 1984 (see Table 1). Concerns about the below-replacement fertility rate led the Soviet government to implement a maternity benefits program that increased childbearing in the early 1980s (Malkova 2018). Marriage and childbearing were near-universal (Scherbov and Van Vianen 2001), and the rates of out-wedlock childbearing and cohabitation were relatively low.[17]

These features of marriage and fertility reflect the strong incentives embedded in the Soviet system promoting marriage and family. For example, married couples with children were given preference in housing allocation, childless couples and individuals were taxed and there were no legal protections for cohabiting couples (Andreev et al. 2002). The strong incentives to marry combined with the limited availability of contraceptives and early age at first sexual relations in Russia meant that "shotgun marriages" occurred frequently; 30 to 40 percent of all first births within marriage were premarital conceptions in the 1970s and 1980s (Jasilioniene 2007). At the same time, divorce was relatively easy and the crude divorce rate had risen from 3.0 divorces per 1000 population in 1970 (Goskomstat 1998) to 4.0 by 1984 (Table 1). Remarriages also increased significantly in the postwar period, from less than 10 percent of all marriages in 1950 to roughly one-quarter by 1985 (Avdeev and Monnier 2000).

The infant mortality rate, considered a key indicator of population health, had declined significantly after World War II, from over 200 infant deaths per 1,000 births in 1940 to 26.6 deaths births by 1965. This may be due to the vast expansion of the public health care infrastructure over this period, the large gains in female education, improvements in nutrition and the increased share of the population with access to clean water and central heating (Brainerd 2010). However, the decade of the 1970s saw virtually no improvement in the infant mortality rate, and it remained

[17] The rate of out-of-wedlock childbearing was 11 percent in 1980; the cohabitation rate was 4 percent in 1994, the earliest data available on cohabitation (Avdeev and Monnier 2000). The share of childless women in Russia was 4 to 7 percent in this period (Zakharov 2008).

high relative to other developed countries – perhaps as a consequence of the rising alcohol consumption of women at the time. The infant mortality rate was 20.5 in Russia in 1984 (Table 1) as compared with a U.S. rate of 12.0 in 1980 (CDC 1989). The Russian infant mortality rate of 1984 is roughly the same level as the 2020 infant mortality rate in Indonesia, Guatemala, Bolivia and the Philippines (UNICEF 2020).[18]

II. Conceptual Framework

A significant decrease in alcohol consumption is likely to have far-reaching effects on family well-being in addition to its direct effects on health and mortality. Unambiguously, reduced alcohol consumption is predicted to directly reduce the mortality of both men and women in Russia, due to the large share of alcohol-related deaths in overall deaths (Zaridze et al. 2009a). The campaign reduced alcohol consumption by at least 25 percent and reduced binge drinking. The effects of the anti-alcohol campaign on infant mortality, fertility, marriage and divorce are more ambiguous, however, because heavy alcohol consumption affects many dimensions of family life including wages, household resources, intrahousehold bargaining power, marital stress, domestic violence and maternal behavior such as prenatal care and breastfeeding.

For infant mortality, correlational literature in epidemiology and public health has established a strong association between excessive alcohol consumption in pregnancy and the risk of miscarriage and infant death (Strandberg-Larsen et al. 2009; Anderson et al. 2012; O'Leary et al. 2013; Sundermann et al. 2019; Sundermann et al. 2021).[19] The MLDA evidence from the U.S. finds a quantitatively small but statistically significant effect of increased access to alcohol for

[18] The Soviet definition of infant mortality differed from that of the West in this period and underestimated the infant mortality rate; further details are in footnote 23 below. See Brainerd (2010) for a discussion of trends in infant mortality and other measures of population health in the postwar period.

[19] These studies are observational and do not control for maternal behavior that may be correlated with infant outcomes and maternal alcohol consumption -- such as poor diet – so the relationship between maternal alcohol consumption and infant mortality and miscarriages or infant death cannot be interpreted as causal.

teenagers on the risk of low birthweight, which is a significant risk factor for infant mortality (Fertig and Watson 2009; Barreca and Page 2015). However, as far as we know, there is little causal evidence of the effect of maternal alcohol consumption on infant mortality.

Besides the direct effect of exposure to alcohol on the developing fetus, maternal alcohol consumption may also affect infant health by changing maternal behavior. Alcohol consumption can increase risky sexual behavior (Carpenter 2005), so reduced heavy alcohol consumption may change the composition of births towards fewer unplanned or out-of-wedlock births, which may improve infant outcomes. For instance, Fertig and Watson (2009) show that MLDA laws affect infant health through their effect on family composition. In addition, reduced alcohol consumption may change maternal behavior and improve infant health through, for example increased breastfeeding, more frequent prenatal visits or reduced smoking.[20]

The indirect effect of reduced alcohol consumption on household resources and parental outcomes is also likely to affect infant health. First, expenditures on alcohol comprised 15 to 20 percent of household expenditures in Russia in this period (Treml 1982; Tarschys 1993), so a reduction in household expenditures in response to alcohol restrictions would increase disposable household income. A similar effect could operate through increased labor productivity, if reduced absenteeism and drunkenness on the job improved labor productivity and therefore wages. While there is little evidence on the causal effects of unanticipated income shocks to family income on infant mortality, there is persuasive evidence that negative shocks to per capita GDP increase infant mortality and greater nighttime luminosity (a measure of local economic activity) reduces infant mortality in developing countries (Baird, Freidman and Schady 2011; Kammerlander and Schultze

[20] Evidence indicates that smoking and alcohol consumption are complements (Decker and Schwartz 2000). However, maternal smoking did not change when the MLDA increased in the U.S., although maternal drinking fell (Fertig and Watson 2009). Based on retrospective smoking behavior from the 2009 and 2016 Global Adult Tobacco Surveys in Russia, we estimate that 9 percent of Russian women smoked in 1985-1990 (GATS data source: https://www.who.int/teams/non communicable-diseases/surveillance/systems-tools/global-adult-tobacco-survey).

2023). Moreover, cash and near-cash transfers through the EITC and Food Stamps in the U.S. caused an increase in mean birthweight and reduced the probability of low birthweight, although a change in neonatal mortality was not detected (Almond, Hoynes and Schanzenbach 2011; Hoynes, Miller and Simon 2015). As a result, the increased household resources or wages from reduced alcohol consumption should reduce infant mortality.

A final mechanism for changes in infant mortality works through potential changes in domestic violence, where the anti-alcohol campaign could have increased or reduced domestic violence. Barron et al. (2022) find that assaults and rape cases decline after a 5 week ban on alcohol in South Africa, but it is unclear whether domestic violence within the home declined. Similarly, alcohol access during teenage years or right after turning age 21 causes an increase in violent crimes and sexual assault (Kypri et al. 2014; Chalfin, Hansen and Ryley 2021), but it is unclear whether these results apply to couples who are older than age 21. If reduced alcohol consumption lowers domestic violence, it may lead to better infant outcomes (Currie, Mueller-Smith and Rossin Slater 2022).[21]

However, the anti-alcohol campaign may have increased domestic violence because it also changed *where* alcohol was consumed. The greatly increased difficulty of drinking on the job, the large penalties for public drunkenness and the ban on alcohol sales in restaurants during the campaign drove some alcohol consumption out of public spaces and into the home (Treml 1987). Newspaper accounts documented the belief that "heavy drinking is most safely done at home, behind the closed door of one's apartment," and that "…drunkenness has been forcefully pushed out of the workplace and off the streets" (Isakova 1986). If excessive alcohol consumption within the home increased as a result of the campaign, domestic violence may have actually increased

[21] Currie et al. (2022) find that assaults during pregnancy increase the probability of low birthweight births.

rather than decreased. Evidence from COVID, for example, indicates that domestic violence calls to police increased by 7.5 percent in first three months of social distancing in U.S. cities (Leslie and Wilson 2020) and that alcohol consumption within the home is a key factor in domestic violence (Chalfin, Danagoulian and Deza 2021). In light of this evidence, it is possible that domestic violence increased in Russia during the anti-alcohol campaign and that infant mortality increased as a result, making the overall predicted effect of the campaign on infant mortality ambiguous.

We predict ambiguous effects of the campaign on fertility as well. On one hand, fertility may rise due to several reasons. First, fertility may rise mechanically due to alcohol's effect on the female and male reproductive systems through a fall in miscarriages (Sundermann et al. 2019, 2021) and a rise in fecundity (Finelli et al. 2021; Van Heertum and Rossi 2017). Second, fertility may rise if problem drinking falls and increases the likelihood of long-term marital stability, thus increasing the return to marriage-specific investments such as children. Third, fertility may rise if entry into marriage increases due to the improved desirability of partners. As the rate of childlessness was low, this may increase fertility. Fourth, fertility may rise as household income rises due to reduced expenditures on alcohol, which were substantial in this context (Treml 1982). Evidence indicates that cash transfers increase fertility (Cohen, Dehejia and Romanov 2013; Gonzalez 2013; Gonzalez and Trommlerova 2023; Slonimczyk and Yurko 2014; Sorvachev and Yakovlev 2020), including maternity leave benefits in the Soviet context (Malkova 2018).[22] Moreover, a positive shock to male income tends to increase fertility (Black et al. 2013; Kearney and Wilson 2018; Schaller 2016).[23]

[22] Paid leave also increased fertility in Austria (Lalive and Zweimuller 2009) and in Germany (Raute 2019).
[23] However, a positive shock to female income may decrease fertility Schaller (2016).

On the other hand, fertility may fall due to several reasons. First, as alcohol consumption, and especially binge drinking, is associated with risky sexual behavior (Carpenter 2005), unwanted pregnancies may fall during the campaign, potentially reducing fertility rates. First sexual relations occurred relatively early in Russia and were often outside of marriage (Jasilioniene 2007). Low availability of effective contraception until the 1990s often produced unplanned premarital conceptions. In the 1980s, the proportion of premarital conceptions comprised about 30 to 40 percent of first births in marital unions, while around 11 percent of births occurred out of wedlock. If a pregnancy was not terminated with an abortion (which were legal until the 12th week of pregnancy), then a decline in riskier sexual behavior could result in a decline in births. Second, if alcohol consumption decreases domestic violence, then we may expect fewer unwanted conceptions within a marriage, potentially reducing fertility rates.

Similarly, the effect of reduced alcohol consumption on entry into marriage and the probability of divorce is difficult to predict. A reduction in binge drinking and increased household resources are likely to change the expected net benefit to marriage, the distribution of gains within marriage and conditions on the remarriage market. For unmarried individuals, the net benefit of marriage may increase if prospective partners are less likely to be problem drinkers, which would increase entry into marriage. The effect of an increase in wages on the incentive to marry is likely to be positive but depends on relative male and female wages (Becker 1973). However, a decline in alcohol consumption could reduce the incentives to marry if shotgun weddings went down. If the anti-alcohol campaign lowered risky sexual behavior and pre-marital conceptions, which were common in our context, this could reduce shotgun weddings. Many couples tried to get married as soon as they became aware of their pregnancy, due to societal disapproval and stigmatization (Jasilioniene 2007), thus shotgun weddings were common.

Court cases showed that alcoholism was a major cause of divorce in the Soviet Union (White 1996), so reduced alcohol consumption in itself may improve the quality of marriages and reduce divorce risk. Obtaining a divorce was a simple procedure, because divorce laws were liberalized in the Soviet Union in 1968, while marriage and divorce laws were unchanged in the 1980s (Avdeev and Monnier 2000).[24] Domestic violence could increase or decrease, as discussed previously, which could increase or decrease divorce. For married couples, a positive income shock may either increase (Böheim and Ermisch 2001, Charles and Stephens 2004, Rainer and Smith 2010) or decrease (Battu et al. 2013) the probability of divorce, while a decline in stress may decrease the probability of divorce (Brainerd and Malkova 2023).

The risk of divorce is also affected by one's outside options on the remarriage market, such as the availability of alternative spouses (Brainerd 2017, Lundberg and Pollack 1996, McKinnish 2007). A lower incidence of alcoholism, as well as reduced morbidity and mortality, increases the pool of 'marriageable' partners and disproportionately benefits women, given the higher incidence of alcoholism among Russian men. Improved outside options are predicted to increase the probability of divorce, as well as improve the distribution of surplus within marriage in favor of the spouse with improved outside options. This may be an important mechanism in our context, because remarriage was common in Russia, where in the 1980s around 25 percent of marriages were re-marriages (Avdeev and Monnier 2000).

In summary, the effect of the anti-alcohol campaign on all of the outcomes we examine – with the exception of adult mortality – are ambiguous, and there is scant evidence in the literature on the effects of a shock to alcohol consumption on these outcomes. As a result, it is valuable to

[24] Women initiated most divorces in the Soviet Union in this period (Bazlyer 1990).

empirically investigate these effects in the context of a large, discontinuous, population-wide decrease in alcohol consumption.

II. Data and Methodology

A. Data

We create a panel of oblast-level data for the Russian republic for the years 1981-1990 using archival data, census data, as well as nonpublic data from the Russian Federal State Statistics Service (Rosstat).[25] The outcome variables include the crude death rate (deaths per 1,000 population), the crude divorce rate (divorces per 1,000 population), the crude marriage rate (marriages per 1,000 population), the general fertility rate (the annual number of births per thousand women ages 15 to 44), and the infant mortality rate (the number of infant deaths divided by the number of live births in a given year).[26] These outcome variables are available by urban and rural area, while deaths, infant deaths, and births are additionally available by sex, enabling us to test for differences in campaign outcomes along these dimensions.

B. Continuous Difference in Differences

We adapt the continuous difference in differences methodology following suggestions from Callaway, Goodman-Bacon and Sant'Anna (2024a, 2024b). We assume that areas with

[25] An oblast is similar to a U.S. state. We use the term 'oblast' to refer to all Russian state-like regions, i.e. oblasts, republics, krais and autonomous okrugs. We exclude the autonomous okrugs and Ingushetiya from the analysis due to inconsistent data reporting. Data sources are described in detail in Appendix A.

[26] The Soviet definition of an infant death differed from the Western definition and understated the infant mortality rate by 14 to 25 percent (Anderson and Silver 1986; Davis and Feshbach 1980). The Soviet definition excluded infants if they were less than 28 weeks gestation, less than 1000 grams, or less than 35 cm in length and died within 7 days of birth. These births were classified as miscarriages rather than as a live birth or infant death (Anderson and Silver 1986). The WHO definition of infant mortality, including these births, was adopted in January 1993 in Russia. Infant mortality rates in rural areas are likely to be measured with error due to underreporting of both births and infant deaths (Anderson and Silver 1986).

greater pre-campaign exposure to alcohol benefited more from a population-wide campaign against alcohol consumption through larger reductions in alcohol consumption.[27]

Our preferred indicator of precampaign exposure to the campaign is the age-standardized death rate due to alcohol-related causes in 1978-1979, calculated from the Russian Fertility and Mortality database of the Centre of Demographic Research of the New Economic School.[28] These are deaths due to alcohol poisoning, alcoholic psychosis, chronic alcoholism, other psychoses, other diseases of the nervous system, chronic liver disease and cirrhosis, pancreatic disease, ill-defined conditions, other accidental poisoning, suicide and undetermined injury. Figure 2 shows that mortality due to alcohol related causes in Russia tracks alcohol consumption closely, so this measure arguably closely reflects the level of excessive alcohol consumption in an oblast prior to the campaign. In addition, alcohol poisoning and related fatalities are likely to be more precisely measured than alcohol consumption measures. Because our identification strategy uses variation in campaign intensity at the oblast level, it is important that we do not have measurement error in our measure of campaign intensity. Alcohol consumption is either significantly underestimated because it measures alcohol sales in retail outlets, excluding samogon, or it is imprecisely estimated because samogon consumption itself is imprecisely estimated.[29] In contrast, Russia's mortality data for this period was reasonably high-quality (Leon et al 1997; Wasserman and Värnik 1998). All sudden or unexpected deaths were legally required to be investigated by autopsy, and death by alcohol poisoning was determined by a blood alcohol concentration of 250 mg/dl or

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[27] Previous papers that used a similar strategy include Bhattacharya et al. (2013), Bleakley (2007, 2010), Qian (2008), Miller and Urdinola (2010) and Nunn and Qian (2011). We follow recommendations from the latest literature.

[28] http://www.demogr.nes.ru/index.php/en/demogr_indicat/data_description. The cause of death codes are given in Appendix A. This measure of alcohol-related causes of death is based on that of Nemtsov, Neufeld and Rehm 2019. Deaths by cause and oblast are not available for years closer to the campaign, i.e. 1980 through 1984.

[29] Samogon consumption is estimated based on either (1) sugar sales or (2) by predicting total alcohol consumption from the reported blood alcohol concentrations from autopsies, using the difference between total alcohol consumption and official alcohol sales to estimate samogon consumption. See Nemtsov (2000) and Bhattarcharya et al. (2013) for details.

higher (Stickley et al 2007).[30]

Even though we have a continuous measure of campaign intensity (treatment dose), we follow recommendations from Callaway, Goodman-Bacon and Sant'Anna (2024a, 2024b) and aggregate across treatment doses. Specifically, we create three types of regions: (1) 'high dose' regions whose SDR is above the 60th percentile, (2) 'medium dose' regions whose SDR is above the 20th but below the 60th percentile and (3) 'low dose' regions whose SDR is below the 20th percentile. Then, we turn the continuous difference in differences estimator into a "binarized" DID estimator by performing two regressions. In the first, we use the 'high dose' regions as the treatment group and the 'low dose' regions as the control group,

$$M_{o,y} = \alpha + \sum_{k=81}^{n} \theta_k D_h 1(y = k) + \sum_{k=n+2}^{90} \pi_k D_h 1(y = k) + \delta_o + \gamma_y + X_{o,y} + \epsilon_{o,y} \quad (1)$$

where $D_h = 1$ for 'high-dose' regions and =0 for 'low-dose' regions. In the second, we use the 'medium dose' regions as the treatment group and the 'low dose' regions as the control group.

$$M_{o,y} = \alpha + \sum_{k=81}^{n} \theta_k D_m 1(y = k) + \sum_{k=n+2}^{90} \pi_k D_o 1(y = k) + \delta_o + \gamma_y + X_{o,y} + \epsilon_{o,y} \quad (2)$$

where $D_m = 1$ for 'medium-dose' regions and =0 for 'low-dose' regions.

In both regressions, $M_{o,y}$ is an outcome variable at the oblast, o, and year, y, level (crude death rates per 1,000 population, infant mortality rates, general fertility rates (GFR), new marriages rate per 1,000 population and divorces per 1,000 population), δ_o are oblast fixed effects, while γ_y are year fixed effects, $1(y = k)$ is a dummy for year k, and $X_{o,y}$ are annual covariates such as the number of doctors per capita and hospital beds per capita. For the GFR, the year 1985 is omitted, meaning that $n = 84$ in equation (1) which normalizes the estimates of θ and π to zero in 1985. For all other outcomes, the year 1984 is omitted meaning that n=83. While mortality and marriage

[30] Bhattacharya et al. (2013) use total registered alcohol sales per capita or total registered alcohol sales plus estimated samogon consumption as their measure of precampaign exposure. Similarly, we find declines in the crude death rate using our intensity measure. Bhattacharya et al. (2013) had limited years and did not have deaths data by sex or urban and rural.

outcomes can change soon after the start of the campaign in June of 1985, it takes longer to carry a baby from conception, thus we only expect changes in childbearing in early 1986.

C. *Interpretation and Internal Validity*

The coefficients θ test for whether outcome variables were on parallel trends in: 'high-dose' versus 'low-dose' regions in equation (1) and 'medium-dose' versus 'low-dose' regions in equation (2). In equation (1), the coefficients π measure the average treatment effect on the treated in the 'high-dose' regions minus the average treatment effect on the treated in the 'low-dose' regions ($ATT_{High} - ATT_{Low}$). In other words, the effect of the campaign in 'high-dose' regions relative to no campaign minus the effect of the campaign in 'low-dose' regions relative to no campaign. Similarly, in equation (2) the coefficients π measure: $ATT_{Medium} - ATT_{low}$. Thus, we estimate a lower bound of the ATT_{High} and ATT_{Medium} parameters as long as ATT_{Low} is nonzero and in the same direction as ATT_{High} and ATT_{Low}, which is plausible because the campaign was in place in all regions. Please see Appendix B for derivations of the estimate interpretations. The above interpretation of the coefficients rests on the assumption of parallel pre-trends in the 'high-dose' and 'low-dose' regions as well as between 'medium-dose' and 'low-dose' regions.

If one wants to interpret the estimate ($ATT(h) - ATT(l)$) as the causal effect of going from the low dose to the high dose among the high dose regions, then one needs to make stronger assumptions. Appendix B shows that this assumption is that the average treatment effect of the low dose relative to being untreated is the same among the low-dose and the high-dose regions. One also needs to be careful when interpreting the differences in the coefficients in equation (1) and (2). In particular, if our estimates of π when the treatment group is the high-dose regions is greater in magnitude than the estimates of π when the treatment group is the medium-dose regions it may not necessarily be because of the larger treatment dose in the high-dose regions relative to the low-dose regions. The difference in coefficients could also be due to the greater responsiveness of the high-dose regions to the same alcohol reductions as the medium-dose regions.

For ease of interpretation, we convert these estimates into percent changes in each outcome variable due to the anti-alcohol campaign and present them in all of our graphs. To do this, we divide the coefficients by the pre-treatment mean of the outcome variable in the treatment group (either the high-dose or the low-dose group).

III. Effect of the Anti-Alcohol Campaign on Adult Mortality

A. Descriptive Evidence of Causal Effects

A remarkable decline in deaths in Russia occurred as soon as the campaign began in June 1985. Figure 1 shows an immediate decline in deaths between May and June 1985 which was sustained through 1990. This immediate decline is especially prominent among urban and rural men (panels A and B).

Descriptively, death rates went down the most in oblasts with higher exposure to the campaign. Figure 3 presents the death rates for the high-dose and low-dose regions. Panel A shows that before the campaign, the crude death rates were on similar trends in the high and low-dose oblasts.[31] Consistent with an effective anti-alcohol campaign, the high-dose regions experienced larger death rate reductions during the campaign, which is true for urban men, urban women, rural men and rural women (Figure B5).

[31] The death rates were likely lower in oblasts in the high-dose regions, because the population in these oblasts is younger, leading to lower death rates.

B. Effect on Alcohol Consumption

We present evidence that the high-dose oblasts experienced a decline in alcohol consumption relative to the low-dose regions. For this purpose, we use equations (1) and (2) and use alcohol consumption as a dependent variable. Figure 2 shows that total alcohol consumption dropped by at least 9 percent in 1986 in high-dose regions persisting to at least a 12 percent decline in 1990. The decline in medium-dose regions also persisted through 1990, but was smaller as expected. Figure B7 highlights which types of alcohol were most affected. Hard alcohol and vodka experience declines already in 1985 which persists through 1990. However, the effects on wine and beer consumption are more mixed. These findings suggest that the main mechanism is through a decline in the consumption of hard alcohol. A caveat of this analysis is the potential measurement error in alcohol consumption.

C. Results for Crude Death Rates: by Urban/Rural and Sex

The anti-alcohol campaign led to a sustained decline in mortality rates for five years since the campaign's implementation. Panel A of Figure 5 presents coefficients from equations (1) and (2) where the coefficients are divided by the pre-treatment dependent variable mean for medium-dose regions in equation (1) and divided by the pre-treatment mean for high-dose regions in equation (2). The coefficients for the years 1981 to 1984 are close to zero and are on a flat trend, meaning that mortality rates were evolving similarly in low-dose and medium/high-dose regions. In 1985, when the campaign had been in place for 7 months, the death rates in the high-dose regions declined by at least 3.5 percent. This drop is consistent with the immediate decline of mortality rates in June of 1985 in Figure 1. In the high-dose regions, the mortality rate drops further by at least 7 percent in 1986 and the declined is sustained through 1990. The coefficients for the medium dose regions are smaller in magnitude, which is consistent with a smaller decline in alcohol consumption. However, we cannot rule out that differential responsiveness to similar declines in alcohol consumption due to regional characteristics explains this result.

We may expect differential effects of the campaign in urban and rural areas. On one hand, rural areas may experience lower declines in mortality, because they could more easily substitute purchased alcohol with samogon, thus leading to lower reductions in alcohol consumption. On the other hand, rural areas had mortality rates that were 40 percent higher than in urban areas, making it more likely that a greater share of the rural population was on the margin of dying from alcohol consumption. Rural areas were less educated, had lower income and had less medical care, which explains their higher mortality. Moreover, if rural areas had a higher baseline level of drinking, then they may have decreased their alcohol consumption by more than urban areas (even if they substituted some consumption to samogon). Two pieces of evidence support higher alcohol consumption among rural areas. First, the standardized death rate due to external causes (most of which are alcohol related in Russia) in 1984 was at least 40 percent higher in rural relative to urban areas among both men and women.[32] Second, in 1989, the alcohol related standardized death rate was 19 percent higher in rural areas, and must reflect effects of the anti-alcohol campaign.

Rural areas experienced substantially larger reductions in mortality rates relative to urban areas leading to a reduction in the gap in mortality rates among urban and rural areas. Figure 4 (panel B) demonstrates similar trends in mortality rates in both rural and urban areas among low-dose and high-dose regions. Both urban and rural areas experienced immediate declines in mortality rates, where in 1985 the mortality rate in high-dose regions went down by 2 percent in urban areas, and by at least 5 percent in rural areas. By 1986, mortality rates declined by at least 5

[32] These numbers are from the Demographic Yearbook of Russia in 2002. Deaths from external causes include: all accidents (motor vehicle and other transport, accidental falls, accidental drowning, deaths due to fire, accidental poisoning by alcohol, and other accidents) suicide, and homicide.

percent in urban and by at least 12 percent in rural areas. The mortality decline in rural areas remains at least twice that in urban areas through 1990. This finding suggests that, even in the presence of substitution of samogon, the higher alcohol consumption and mortality in rural areas resulted in a larger share of the population on the margin of dying from alcohol resulted causes. Thus, the campaign led to a reduction in the gap in mortality rates in urban and rural areas.

Figure 4 (panels C and D) shows that the mortality rate declined similarly (in percent changes) among men and women in both urban and rural areas. This finding indicates that even reductions of alcohol consumption from lower levels may result in substantial increases in life expectancy.

C. *Results for Crude Death Rates: by Cause of Death and Age*

The campaign led to declines in mortality rates among most ages. Table B1 presents results from equation (1) that uses 1978/79 as the pre-year and years 1985/86, 1988, 1989 and 1990 as post-years because of limited availability of data on deaths by age. We demonstrate reductions in death rates from the age groups of 20 to 24 through ages 75 to 79. The percent change in mortality is smaller for older ages and is the highest in prime ages. This finding highlights that the campaign affected the entire population highlighting the enormous scope of the campaign.

The campaign also led to declines in mortality among most causes of death. Table B3 presents results from equation (1) that uses 1978/79 as the pre-year and years 1988, 1989 and 1990 as post-years because of limited availability of data on deaths by cause. Figure 6 shows that the campaign led to a reduction of at least 48 percent in alcohol related causes in 1988 among the high-dose regions. It also led to reductions among infectious, respiratory, ischemeous heart disease. Deaths due to external causes went down substantially, where the causes are homicide, accidental drowning, motor vehicle accidents and suicides. Interestingly, the decline in homicides is larger among women indicating a decline in violence against women. Otherwise, declines are quite similar by cause among men and women. We find no evidence of a change in mortality due to causes we do not expect to be affected by alcohol consumption (placebo analysis) such as genito-urinary, nervous system, digestive system and neoplasms.

IV. Effect of the Campaign on Infant Mortality Rates and Stillbirths

The substantial decline in mortality among women underscores the importance of studying the effect of this campaign on the health of children. Panel B of Figure B3 shows that infant deaths experienced a drop in the second half of 1985, relative to their levels in 1984, which is consistent with a reduction of alcohol consumption among mothers after the start of the campaign. Infant deaths remain lower in 1987 relative to 1984 levels, while the number of births is higher. [33]

A. Descriptive Evidence of Causal Effects

Descriptively, infant mortality rates declined more in oblasts with higher alcohol related SDR. Panel B of Figure 3 shows that while the infant mortality rates (IMR) in higher and lower dose regions were on similar trends before the campaign, higher dose oblasts experienced a larger drop in IMR. While in 1984, the IMR was about 12 percent higher in higher dose oblasts, the gap in IMR between the high and low dose oblasts disappeared in 1985. By 1986, the IMR was lower in the higher dose relative to lower dose regions, meaning that the reduction in alcohol consumption closed and then reversed the gap in IMR between oblasts with high and low alcohol related mortality. Figure B9 demonstrates that while IMR among urban boys and girls are similar in magnitude before the campaign, starting from 1985 high-dose regions experience a larger

[33] We do not have data on monthly infant deaths in 1986.

decline. Moreover, while before the campaign both rural boys and girls had larger IMR in high dose regions, this gap is eliminated once the campaign is in place.

B. Results: overall and by urban/rural and boys/girls

The anti-alcohol campaign resulted in substantial declines in infant mortality rates. Panel A of Figure 7 shows that IMR declined immediately in 1985 by at least 8 percent in high-dose regions.[34] This decline is sustained through 1989; the estimate in 1990 becomes insignificant, but is still sizable. The coefficients in the years 1981 to 1984 are statistically insignificant providing evidence against a pre-trend. While the decline in the IMR is larger in rural areas, it is not as stark as for adult CDR (Figure 7, panel B). We do not find evidence of effects on IMR in medium-dose regions, as the coefficients are smaller in magnitude and are statistically insignificant. However, as we are providing lower bounds of treatment effects, this finding could also be due to medium-dose regions experiencing similar declines in IMR as low-dose regions. In sum, the presence of a negative effect in high-dose regions and the lack thereof in medium-dose regions provides suggestive evidence that larger reductions in drinking as well as reductions from higher levels of drinking has larger effects on infant mortality.

IMR declines among both boys and girls in high-dose regions (Figure B13, panel D) indicating that maternal alcohol consumption is harmful for both sexes. The decline in IMR is a little larger among boys than among girls (though the difference is not statistically significant), which is consistent with the medical literature that boys are more sensitive than girls to health shocks (Sanders and Stoeker 2015). The difference between the urban and rural coefficients is larger for boys (Figure 7, panel C) relative to girls (Figure 7, panel D) suggesting the importance

[34] The immediate decline in IMR in 1985 cannot be explained by potential differential selection into births, if different women selected into childbearing after the anti-alcohol campaign. The GFR did go up after the campaign, but it did so starting in 1986, meaning that the drop in IMR in 1985 cannot be explained by changes in selection into childbearing.

of the reduction in maternal drinking in rural areas for boys. In the years 1981 to 1984, there is a pre-trend in the direction against finding negative effects on IMR in rural areas, which implies that we are underestimating the true decline in IMR. Goodman-Bacon (2021) argues that causal inference claims can be made when pre-trends go against finding an effect.

C. Results: by Infant Cause of Death

Which infant causes of death are affected? We apply equation (1) and use data from 1978/79 as a pre-year and use 1988, 1989 and 1990 as post-years due to data limitations. These data measure infant deaths (by cause) per 100,000 population. Figure 8 shows a decline in infant deaths in 1988 that is of similar magnitude as IMR in Figure 7. Moreover, deaths among girls ages 1 to 4 decline by a statistically significant 20 percent, while the decline among boys is smaller in magnitude and insignificant.

The decline in IMR is mainly due to statistically significant declines of around 20 percent (among boys and girls) in respiratory diseases that make up at least one third of all infant deaths. We also observe substantial declines in deaths due to infectious diseases, but the coefficients are not statistically significant. Strikingly, boys experience a 49 percent decline in deaths due to external causes (accidental inhalation/ingestion with obstruction to the respiratory tract or other accidents), while the coefficient is smaller and statistically insignificant for girls. There is no evidence of significant changes in deaths due to congenital anomalies (can happen anytime in the first year of life) or perinatal deaths that take place in the last few weeks of pregnancy and the first week after birth. Thus, the decline in infant deaths is due to deaths of infants older than 7 days.

V. Effect of the Anti-Alcohol Campaign on Childbearing and Marital Stability

A1. Crude marriage and divorce rate: Descriptive Evidence

One year after the start of the campaign, Gorbachev reported that the number of divorces resulting from drinking by one of the spouses was down, indicating the government's interest in lowering divorces.[35] We expect that marriages and divorces could change shortly after the start of the campaign, because the no-fault divorce law made divorce an easy procedure (Khazova 2012).

Panel D of Figure 3 presents the crude divorce rate for low and high dose regions. Before the campaign, these divorce rates were on similar trends. Consistent with the anti-alcohol campaign raising the divorce rate, the high dose regions experienced an increase in the divorce rate starting from 1985, while oblasts at the bottom experienced a continuation of a decreasing trend, which decreased the gap in divorce rates between the higher dose and lower dose regions. Panels A and B of Figure B11 show that both urban and rural areas experienced similar patterns. Figure B11 (panels C and D) show no evidence of a differential change in levels or trends in marriage rates among the low-dose and high-dose regions.

A2. Crude marriage and divorce rate: Effects

The anti-alcohol campaign led to an immediate increase in the divorce rate that lasted through 1989. Panel A of Figure 9 shows that the coefficients for years 1981 to 1984 are on a flat trend and close to zero, indicating similar trends in the divorce rate among high- and low-dose regions. The divorce rate increased by at least 5 percent in 1985 and further by at least 10 percent in 1986 in the high-dose oblasts. The increase is sustained through 1989. The increase in divorce is roughly half in magnitude (in 1985 and 1986) among the medium-dose oblasts and the effect

[35] *Pravda*, 27 July 1986, 2.

becomes statistically insignificant starting from 1987. This increase in divorce is robust to using an adjusted divorce rate metric where instead of the total population, we divide by our estimate of the married population (Figure B16, panels A and B).

The rise in divorce rates is more substantial in urban areas. Panel B of Figure 9 shows that while the divorce rate increases among both urban and rural areas, the percent change is double the size in urban areas, and the coefficients are only significant in urban areas. The baseline divorce rate is twice as large in urban relative to rural areas, so there may be more individuals on the margin of a divorce there.

We do not find evidence that the anti-alcohol campaign affected the marriage rate. Figure 9 (panel C) shows coefficients after the campaign that are insignificant and are near zero for the regression with high-dose regions, and we do not find appreciable differences between urban or rural areas (Figure 9, panel D).[36] The lack of an effect on marriage is robust to using an adjusted marriage rate that we construct by dividing by the number of unmarried people instead of by the total population (Figure B16, panels C and D).

B1. General Fertility Rate: Descriptive Evidence

Because the campaign was announced in May and implemented on June 1st, we do not expect changes in childbearing until 1986. If individuals decided to conceive right after campaign implementation, then we expect a rise in births starting from March of 1986 which is 9 months since the start of the campaign. Childbearing could go up a little earlier if pregnant women decided to forego abortions (legal until 12 weeks), or if a drop in alcohol consumption lowered the chance of a miscarriage. Panel C of Figure B3 graphs monthly births in each year from 1984 to 1987 to

[36] Figure B17 (panel B) also shows no evidence of the effect on marriage rates in medium-dose regions.

show that births started going up in March of 1986, which is consistent with the timing of the campaign.

Panel C of Figure 4 presents the higher parity fertility rate for the high and low-dose regions. Before the campaign, the fertility rates were on similar trends. Consistent with the anti-alcohol campaign raising childbearing, the high-dose oblasts experienced larger increases in GFR starting from 1986, which increased the gap between GFR among the high- and low-dose oblasts.

B.2. General Fertility Rate: Effects

We find evidence that the anti-alcohol campaign increased the GFR. We detect a linear pre-trend in the evolution of GFR among the high-dose and low-dose regions before the campaign (1982 to 1985). To address the linear pre-trend, we include linear pre-trends by alcohol related SDR in this analysis (Bhuller et al. 2013, Goodman-Bacon 2021).[37] Panel A of Figure 10 shows that, as expected, the linear pre-trend disappears, and we document a statistically significant increase in the GFR from 1986 to 1989, resulting in a 4 percent increase in GFR in this period. Unlike our mortality outcomes, the coefficients in medium-dose and high-dose regions are more similar, suggesting similar effects on fertility of different magnitude reductions in alcohol consumption. However, the similarity of coefficients could also be due to differences in the medium-dose and high-dose regions that make medium-dose regions more responsive in childbearing behavior to similar magnitude alcohol reductions.

The increase in GFR is due, in part, to a decline in abortions. We perform the analysis in equation (1) with a limited set of years due to data availability and use 1981 and 1982 as pre-years

[37] To estimate differential pre-trends by alcohol consumption, we run a regression using GFR as a dependent variable on the period from 1982 to 1985 that includes oblast fixed effects, a linear year, alcohol related SDR and an interaction of linear year and the alcohol related SDR. Then, we calculate a detrended GFR by subtracting the coefficient on the interaction of year and alcohol related SDR multiplied by year times alcohol related SDR from GFR. Then, we use the resulting detrended GFR to estimate the effects of the anti-alcohol campaign.

and have a post-period consisting of 1985, 1986 and 1988. We find that abortions decline immediately in 1985, reaching a 5 percent decline in 1987 in high-dose regions. Similar to GFR, the magnitudes of coefficients across medium-dose and high-dose regions are much more similar than for mortality outcomes.

The anti-alcohol campaign resulted in an increase in first parity fertility rates. We find that before the campaign high-dose oblasts experienced larger declines in first birth fertility rates, resulting in non-parallel pre-trends. Again, to address the linear pre-trends, we include linear pre-trends by alcohol related SDR in this analysis. Panel C of Figure 10 shows that this results in coefficients for years 1982 to 1985 to be on a flat trend, while the coefficients from years 1987 to 1989 rise over time. By 1989, the first birth fertility rates increased by at least 6 percent in high-dose regions.

In addition, higher parity fertility rates increased. The coefficients on years 1982 to 1985 demonstrate similar trends in GFR among low-dose and high-dose oblasts, thus it is not necessary to control for pre-trends. Panel D of Figure 10 shows that coefficients jump in 1986, indicating at least a 4 percent increase in higher parity births in 1986 in high-dose oblasts. The coefficient returns to zero starting from 1988. However, the coefficients in medium-dose oblasts stay positive through 1989, though they lose significance.

The rise in first births may indicate a decision to have a child sooner, as in our context the level of childlessness was low. Unlike the rising coefficients for first births, the coefficients for higher parity births rose for the first two years and either fell (for high-dose regions) or remained stable (low-dose regions). This could be because authorities started de-escalating the campaign in 1988, or women may have decided not to have higher parity births due to deteriorating economic conditions in the late 1980s and rising inflation.

Alcohol consumption may also affect the health of the fetus, which may lead to a rise in the share of births that are boys (Nilsson 2017), because boys are more sensitive to environmental shocks while in utero. Panel B of Figure 7 shows that this was not the case, as the magnitude of the coefficients are very small, and they are not statistically significant. This finding is consistent with similar-magnitude reductions in IMR between boys and girls, suggesting that the health of both boys and girls in utero was affected by the campaign.

VI. Discussion and Conclusion

In 1985 the Soviet Union implemented an anti-alcohol campaign that led to one of the largest sustained reductions in society-wide alcohol consumption in recent history. Impelled by the myriad harms that excessive alcohol consumption has exacted on Soviet society, the alcohol restrictions significantly reduced mortality among men and women, most age groups and most causes of death while the campaign was in force. Infant mortality fell sharply as well where these reduction lasted for most of the duration of the campaign, underscoring the importance of reductions in female alcohol consumption in improving infant health outcomes.

The anti-alcohol campaign also had unintended, far-reaching effects on family dissolution and childbearing in Russia. While it did not affect marriages, it led to an immediate increase in divorce, indicating that alcohol consumption has a causal effect on partnership dissolution. Further, the campaign led to an increase in fertility rates. This first causal evidence of significant effects of a nationwide reduction in alcohol consumption on childbearing, entry into marriage and marital stability brings to the fore that alcohol consumption, and particularly excessive alcohol consumption, reaches into all aspects of life and has consequential effects on family relationships.

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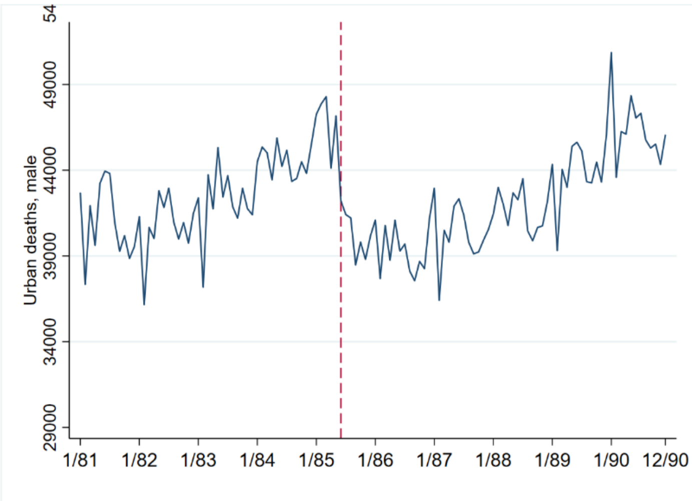
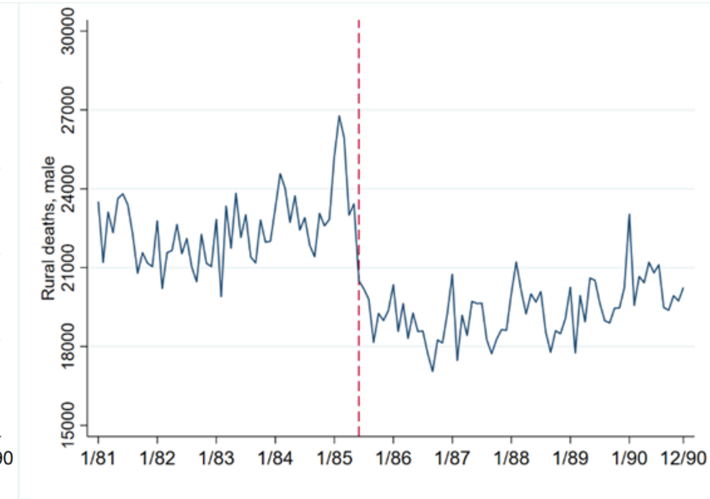
Figure 1. Evolution of Monthly Deaths

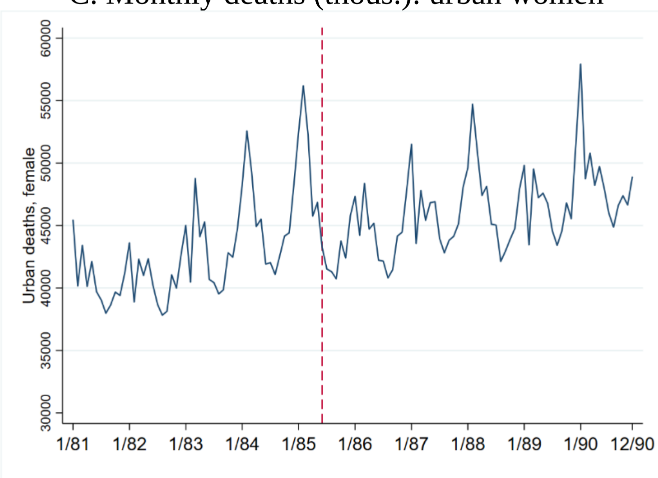
A. Monthly deaths (thous.):urban men



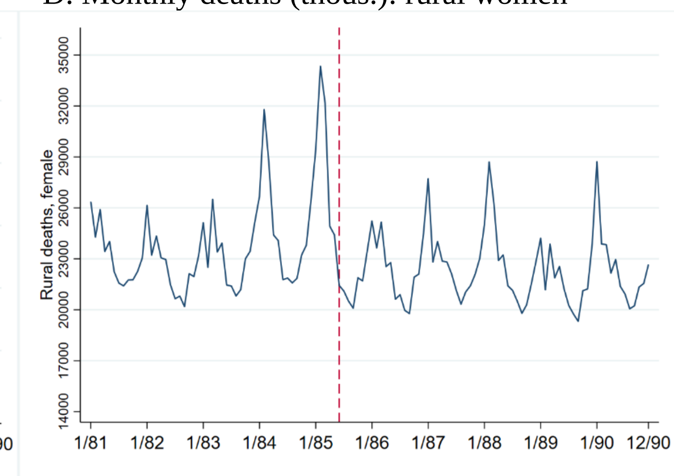
B. Monthly deaths (thous.): rural men



C. Monthly deaths (thous.): urban women



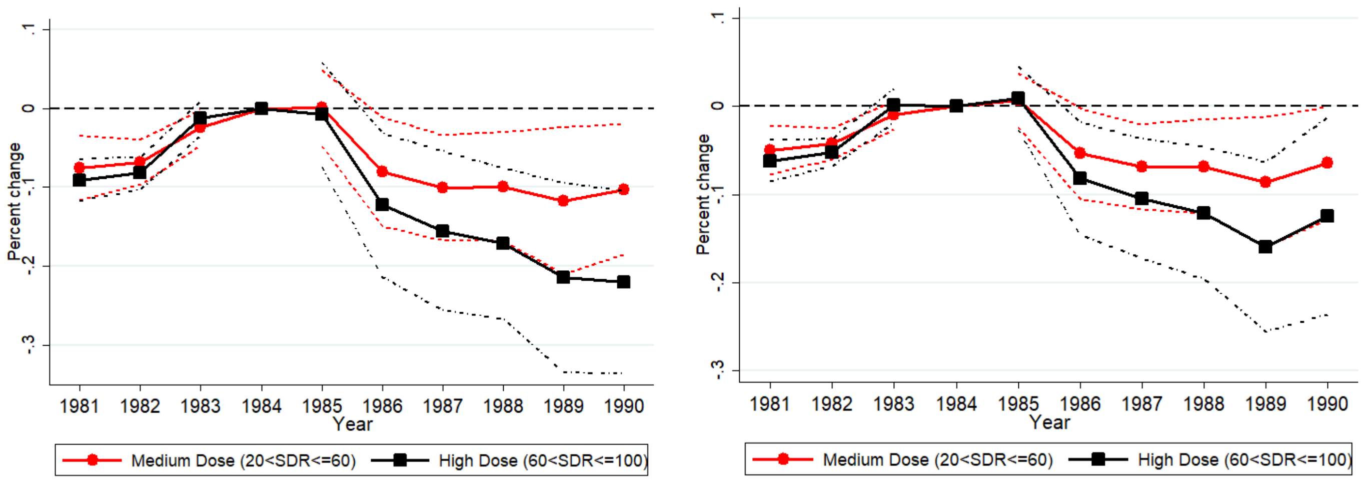
D. Monthly deaths (thous.): rural women



Notes: The graphs present the monthly deaths (in thousands) for urban men, urban women, rural men and rural women. Source: Avdeev and Monnier 1996.

Figure 2. Effect of the Anti-alcohol Campaign on Alcohol Consumption

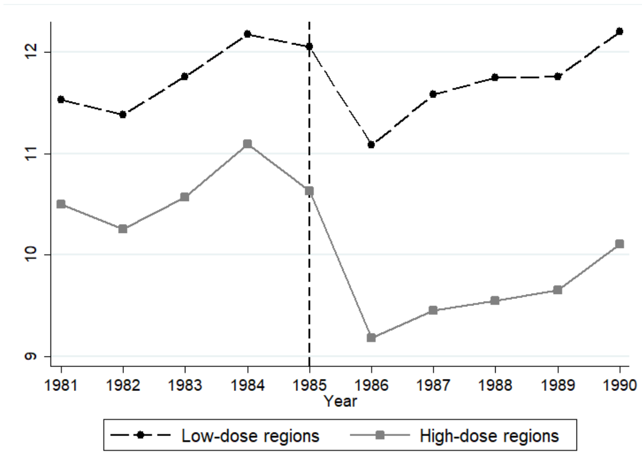
A. Official alcohol | B. Official alcohol + samogon estimates



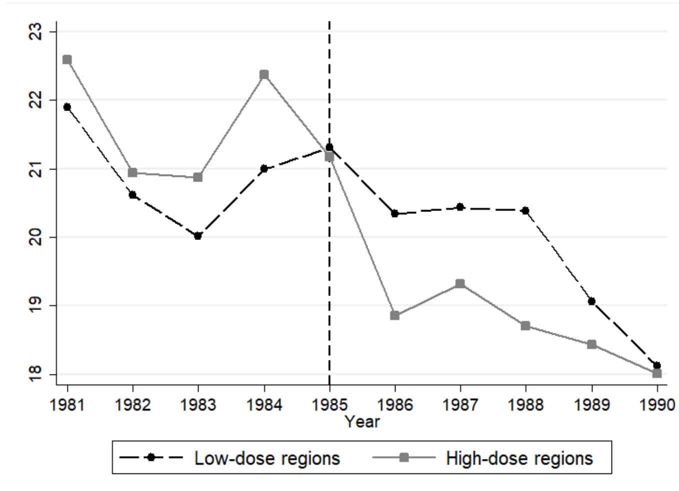
Notes: The figure presents the percent change in official alcohol consumption implied by coefficients θ and π from equation (1). We compare the difference in alcohol consumption among the high-dose/medium-dose regions (treatment group) relative to the low-dose regions (comparison group) relative to the same difference in 1984. We divide the estimates by the mean alcohol consumption in 1984 to obtain percent changes for ease of interpretation. Sources: Russian Fertility and Mortality Database; Bhattacharya et al. 2013.

Figure 3. Outcomes by Precampaign SDR: Low-dose vs. High-dose regions

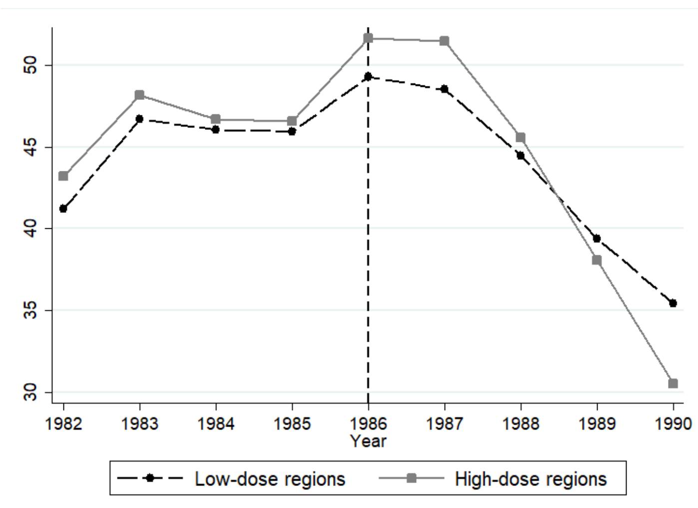
A. Crude Death Rate



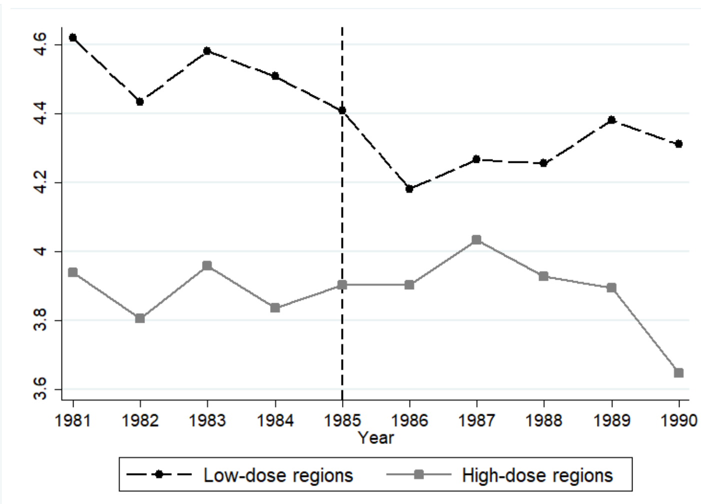
B. Infant Mortality Rate



C. GFR for Higher Order Births



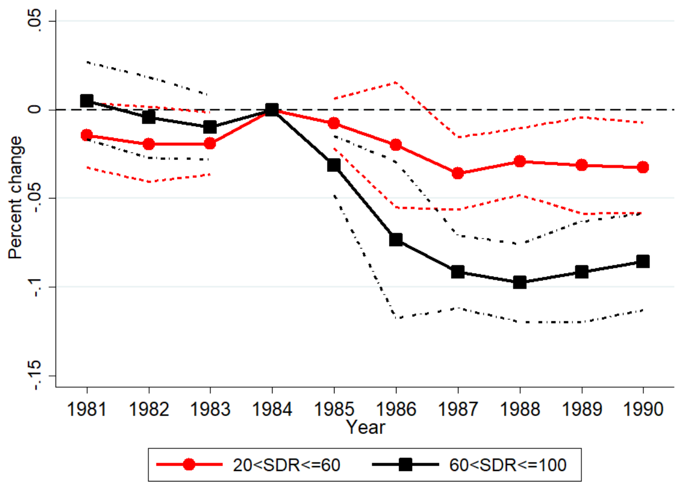
D. Crude Divorce Rate



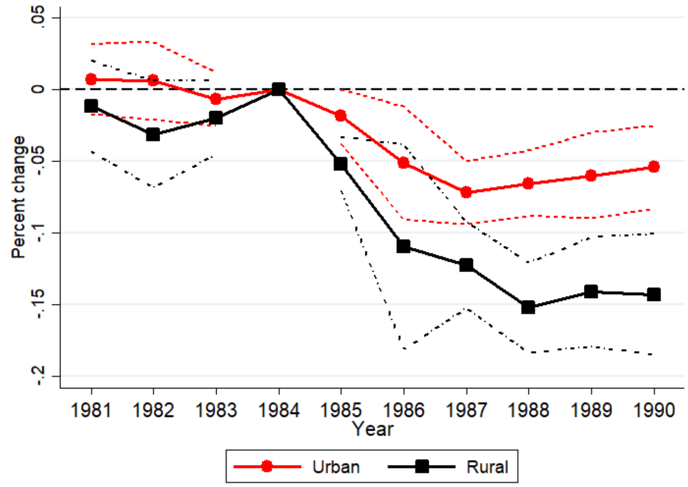
Notes: We plot outcomes for low-dose oblasts (the 1978/79 alcohol-related standardized death rate (SDR) is below the 20th percentile) and high-dose oblasts (the SDR is above the 60th percentile). The crude death rate is the number of deaths per 1,000 population; the infant mortality rate (IMR) is the number of infant deaths per 1,000 births. The General Fertility Rate (GFR) is the number of births per 1,000 women ages 15 to 44. The Crude Divorce Rate is the number of divorces per 1,000 population. Sources: Russian Fertility and Mortality database; the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy); Rosstat.

Figure 4. Effect of the Anti-alcohol Campaign on Crude Death Rates

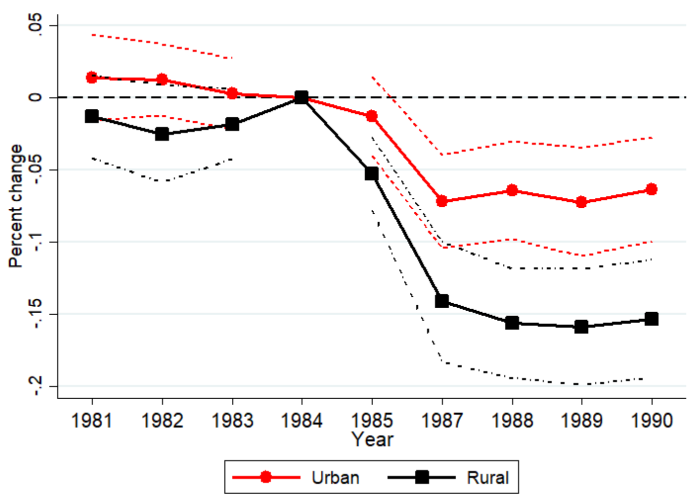
A. RSFSR



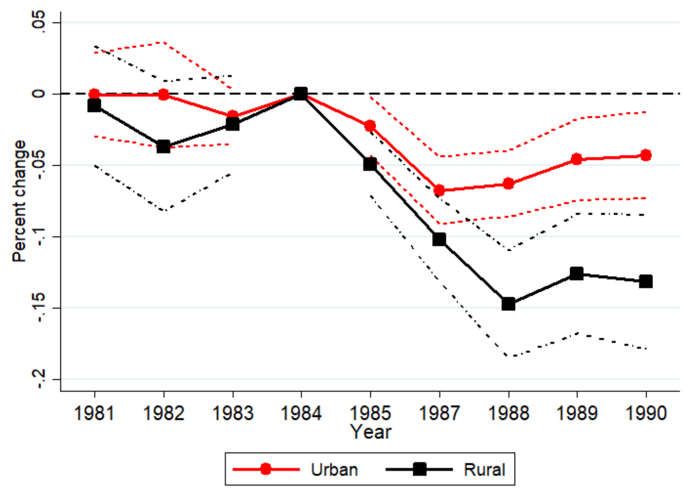
B. Urban vs Rural (high-dose regions)



C. Men: Urban vs. Rural (high-dose regions)

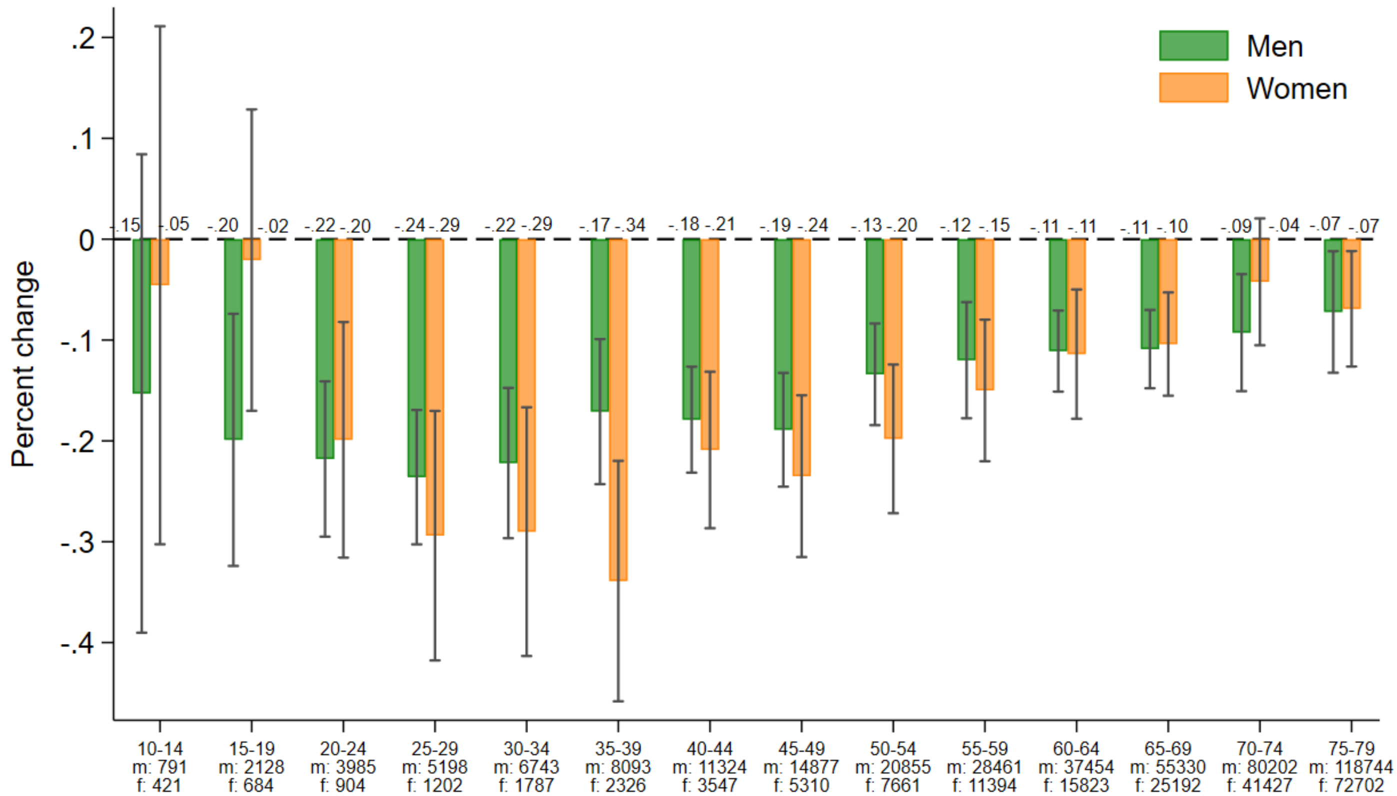


D. Women: Urban vs. Rural (high-dose regions)



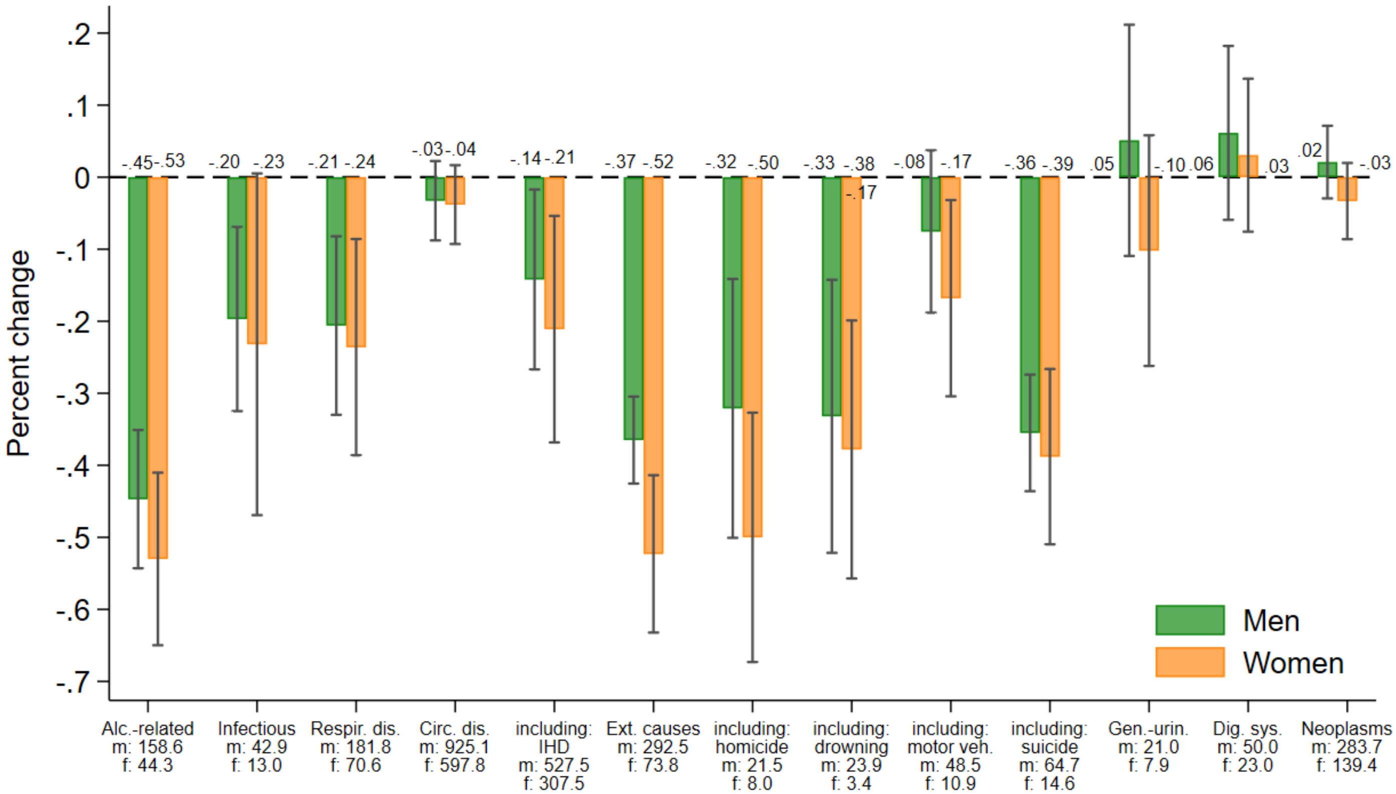
Notes: The coefficients starting from year 1985 present the lower bound of the effect of the anti-alcohol campaign on crude death rates in percent changes using equation (1). We compare the difference in the crude death rate among the high-dose/medium-dose regions (treatment group) relative to the low-dose regions (comparison group) relative to the same difference in 1984. We cluster standard errors at the oblast level. Dashed lines represent 95-percent confidence intervals. Sources: Sources: Russian Fertility and Mortality database; the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy).

Figure 5. Effect of the Campaign on Crude Death Rates by Age: High vs. Low-dose Regions



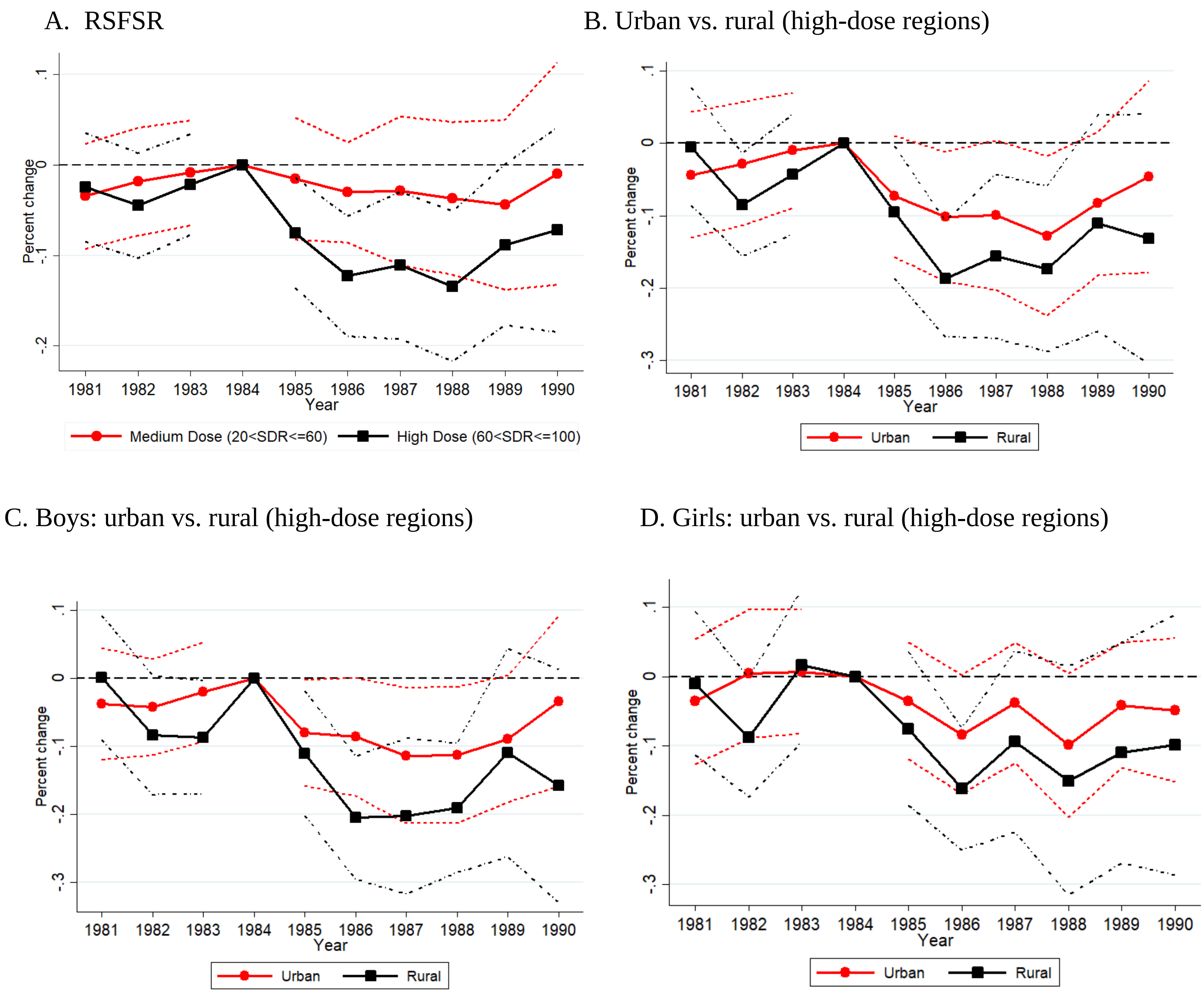
Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes. See notes for figure 4.

Figure 6. Effect of the Campaign on Crude Death Rates by Cause: High vs. Low-Dose Regions



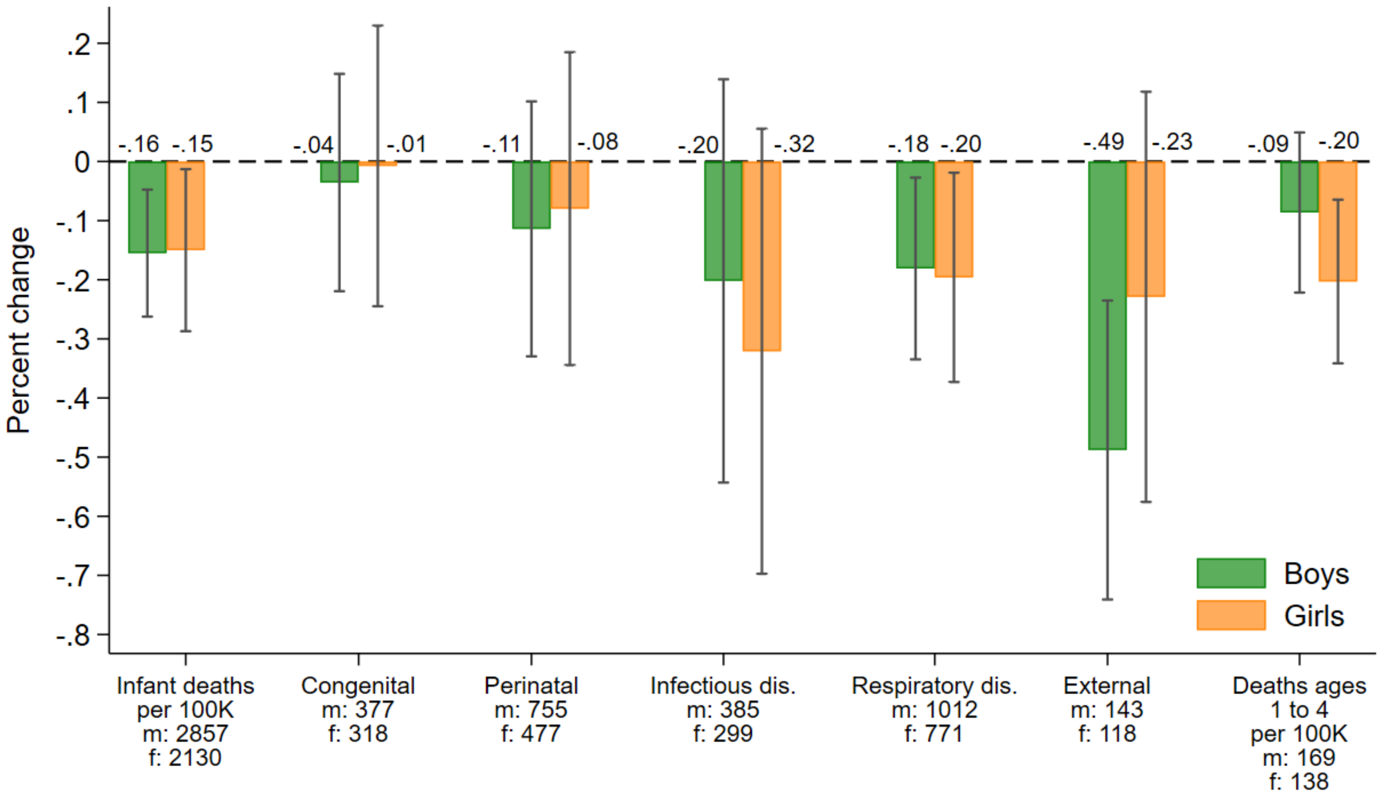
Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes. The causes from left to right are: due to alcohol related causes, infectious diseases, respiratory diseases, circulatory heart diseases, ischemic heart diseases, external causes, homicide, drowning, motor vehicle accidents, suicide, genito urinary, digestive system and neoplasms. See notes for figure 4.

Figure 7. Effect of the Anti-alcohol Campaign on Infant Mortality Rates



Notes: The coefficients present the lower bound for the average treatment on the treated parameter (for medium dose and high dose regions, as labeled) using equation (1) in percent changes. We cluster standard errors at the oblast level. Dashed lines construct 95-percent, point-wide confidence intervals. Sources: Sources: Russian Fertility and Mortality database; the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy); Rosstat.

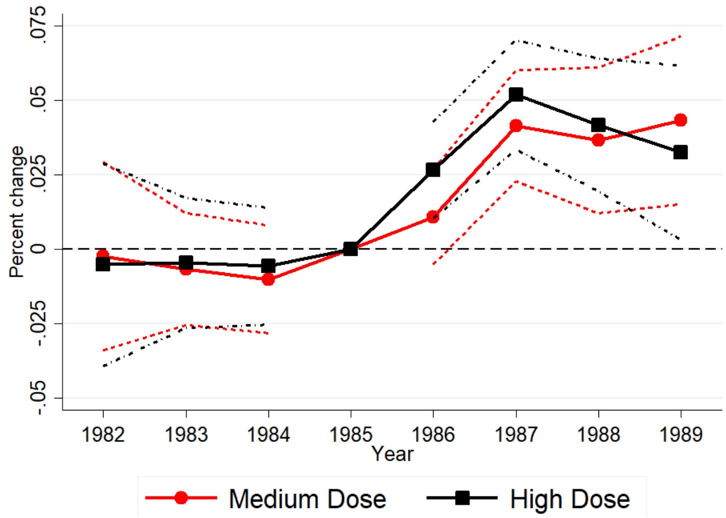
Figure 8. Effect of the Campaign on IMR by Cause: High-dose vs. Low-dose Regions



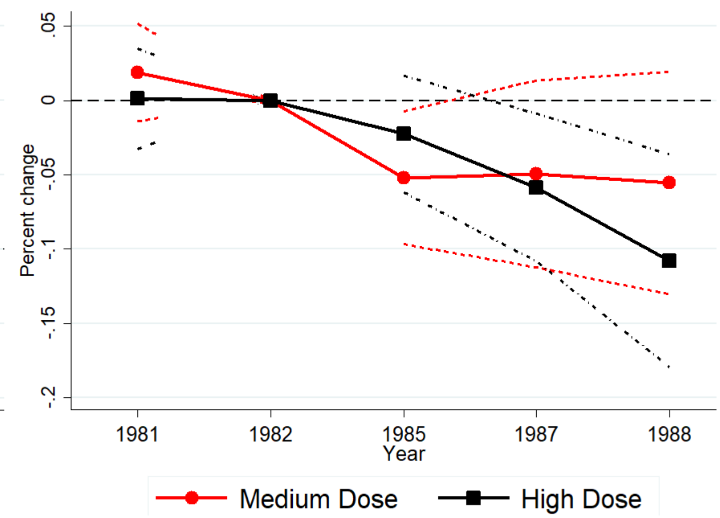
Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes. Infant deaths are measured per 100,000 population. Deaths due to congenital causes take place at any point during the child's first year of life. Perinatal deaths take place in the last few weeks of pregnancy and the first week after birth. Deaths due to external causes include accidental inhalation/ingestion with obstruction to the respiratory tract and other accidents.

Figure 9. Effect of the Anti-alcohol Campaign on Fertility and Abortions

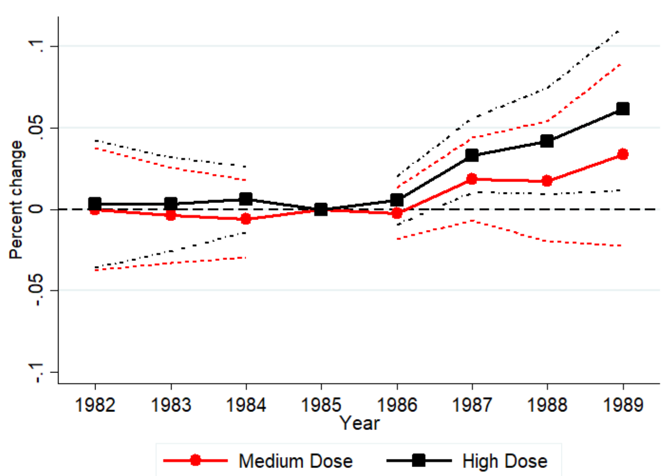
A. General Fertility Rate



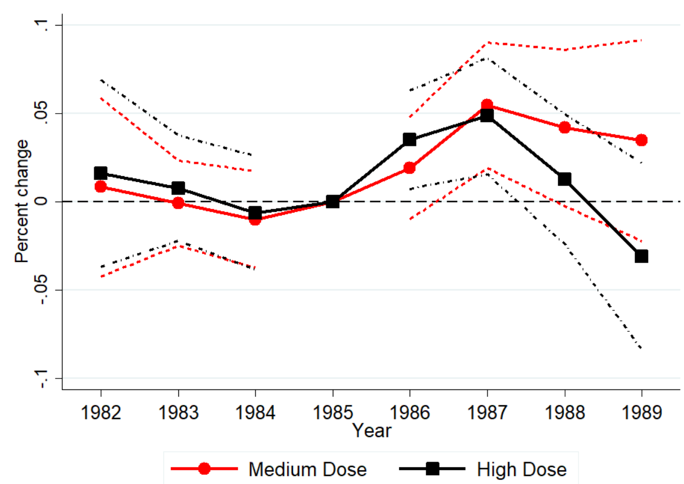
B. Abortion Rate



C. First Birth Fertility Rate



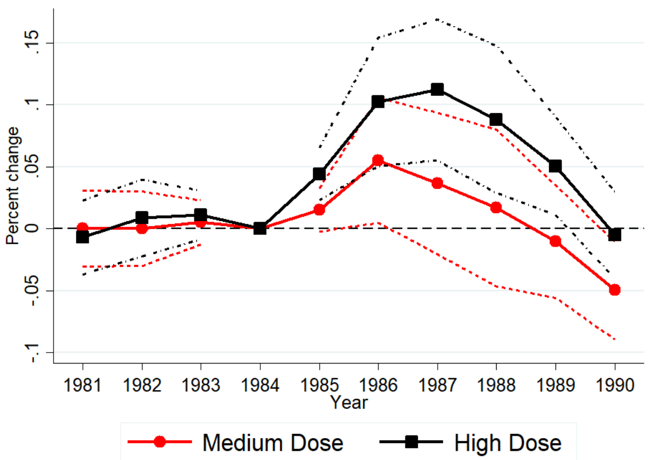
D. Second+ Birth Fertility Rate



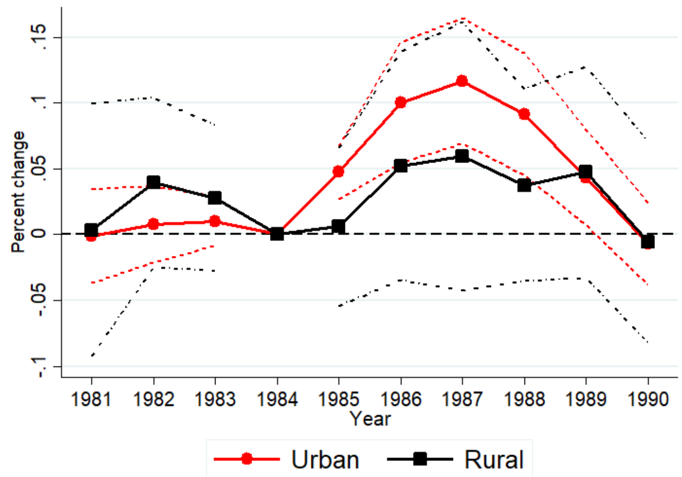
Notes: The coefficients present the lower bound for the average treatment on the treated parameter for medium-dose and high-dose regions using equation (1) in percent changes. We cluster standard errors at the oblast level. Dashed lines construct 95-percent, point-wide confidence intervals. Sources: Sources: Russian Fertility and Mortality database; the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy).

Figure 10. Effect of the Anti-alcohol Campaign on Divorce and Marriage Rates

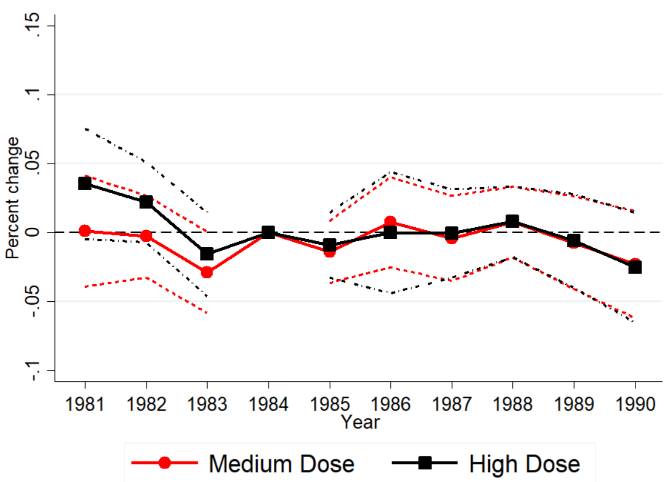
A. Divorce rate in RSFSR



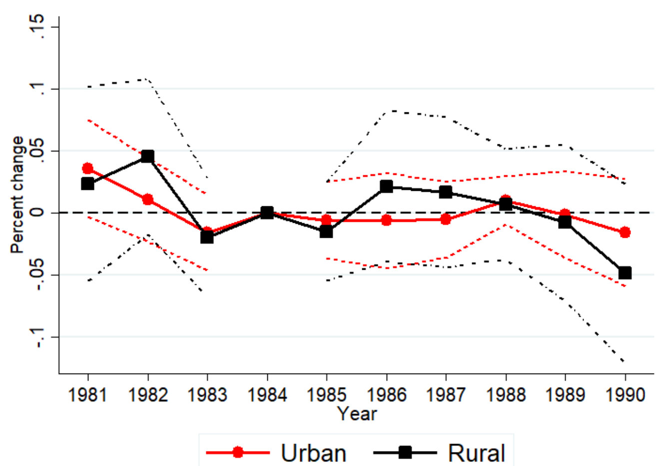
B. Divorce rate: urban vs. rural (high-dose)



C. Marriage rate in RSFSR



D. Marriage rate: urban vs. rural (high-dose)



Notes: The coefficients present the lower bound for the average treatment on the treated parameter for medium-dose and high-dose regions using equation (1) in percent changes. We cluster standard errors at the oblast level. Dashed lines construct 95-percent, point-wide confidence intervals. Sources: Russian Fertility and Mortality database; the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy).

Table 1. Descriptive Statistics

	1984 Mean	Std. dev.
Crude death rate		
All pop.	11.62	1.78
Urban	10.55	1.55
Rural	14.36	3.59
Infant mortality rate		
All pop.	20.49	3.72
Male	23.31	4.33
Female	19.58	3.57
Urban	19.65	3.04
Rural	22.52	6.57
General fertility rate	79.92	19.48
First birth	36.26	9.75
Higher-order births	43.66	14.88
Crude divorce rate	4.04	0.95
Urban	4.75	0.84
Rural	2.21	0.92
Crude marriage rate	9.62	0.71
Urban	9.61	0.81
Rural	9.65	1.76

N = 73 oblasts (71 in rural areas)
Weighted by the relevant 1984 population.
Crude death rate: deaths per 1,000 population.
Infant mortality rate: infant deaths per 1,000 live births
General fertility rate: births per 1,000 women ages 15-44
Crude divorce rate: divorces per 1,000 population
Crude marriage rate: marriages per 1,000 population
Sources: See Appendix A.

Table 2. Effect of the Campaign on Crude Death Rates (Percent Changes) by Cause: High vs. Low Dose Regions

	1988		1989		1990	
Causes	**men**	**women**	**men**	**women**	**men**	**women**
Alc. Related	-0.447***	-0.530***	-0.453***	-0.537***	-0.469***	-0.516***
	(0.0490)	(0.0611)	(0.0461)	(0.0665)	(0.0645)	(0.0677)
Infectious	-0.197***	-0.232*	-0.250***	-0.232*	-0.216***	-0.148
	(0.0652)	(0.121)	(0.0685)	(0.131)	(0.0792)	(0.128)
Respiratory	-0.206***	-0.236***	-0.224***	-0.255**	-0.203***	-0.237**
	(0.0632)	(0.0766)	(0.0710)	(0.0956)	(0.0726)	(0.0880)
Circulatory	-0.0327	-0.0381	-0.0878***	-0.0446*	-0.0879***	-0.0472*
	(0.0281)	(0.0279)	(0.0314)	(0.0264)	(0.0280)	(0.0238)
incl. Isch. Heart dis.	-0.142**	-0.211**	-0.190***	-0.209**	-0.179***	-0.223***
	(0.0637)	(0.0802)	(0.0685)	(0.0821)	(0.0599)	(0.0704)
External	-0.365***	-0.523***	-0.362***	-0.518***	-0.331***	-0.452***
	(0.0308)	(0.0557)	(0.0279)	(0.0581)	(0.0352)	(0.0551)
incl. Homicide	-0.321***	-0.500***	-0.187**	-0.467***	0.0485	-0.309***
	(0.0917)	(0.0883)	(0.0832)	(0.0814)	(0.118)	(0.0939)
incl. Accidental drowning	-0.332***	-0.378***	-0.310***	-0.422***	-0.390***	-0.408***
	(0.0967)	(0.0914)	(0.0950)	(0.0919)	(0.105)	(0.0938)
incl. Motor vehicle	-0.0755	-0.168**	-0.0720	-0.102	-0.0671	-0.0276
	(0.0575)	(0.0695)	(0.0517)	(0.0703)	(0.0574)	(0.0624)
incl. Suicide	-0.355***	-0.388***	-0.353***	-0.431***	-0.349***	-0.415***
	(0.0413)	(0.0621)	(0.0443)	(0.0640)	(0.0476)	(0.0628)
Genito-urinary	0.0511	-0.102	0.0324	-0.0579	0.0759	-0.0496
	(0.0819)	(0.0817)	(0.0783)	(0.0608)	(0.0670)	(0.0642)
Nervous system	0.0819	0.0308	0.0956	0.169	0.163	0.208*
	(0.109)	(0.131)	(0.110)	(0.101)	(0.107)	(0.122)
Digestive system	0.0614	0.0305	0.0675	0.0582	0.0514	0.00849
	(0.0616)	(0.0542)	(0.0621)	(0.0582)	(0.0622)	(0.0647)
Neoplasms	0.0209	-0.0332	0.0216	-0.0349	0.0261	-0.00707
	(0.0257)	(0.0270)	(0.0328)	(0.0230)	(0.0306)	(0.0271)

Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes.

Table 3. Effect of the Campaign on Maternal Mortality (Percent Changes): High Dose vs. Low-Dose Regions

Causes	1988	1989	1990
Maternal mortality	-0.209*	-0.393***	-0.365***
	(0.105)	(0.109)	(0.132)
1. due to abortions	-0.470***	-0.534***	-0.619***
	(0.130)	(0.130)	(0.146)
a. started in hospitals	-0.199	0.927	0.694
	(1.115)	(1.479)	(0.982)
b. started outside hospitals	-0.499***	-0.574***	-0.659***
	(0.136)	(0.136)	(0.160)
2.due to other causes	0.0150	-0.271*	-0.173
	(0.147)	(0.154)	(0.195)

Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes. Data: 1978/79, 1988, 1989 and 1990.

Table 4. Effect of the Campaign on IMR by Cause (Percent Changes): High vs. Low Dose Regions

	1988		1989		1990	
Causes	boys	girls	boys	girls	boys	girls
Infant Deaths per 1000K Pop	-0.155***	-0.150**	-0.115*	-0.107	-0.00317	-0.0356
	(0.0548)	(0.0699)	(0.0660)	(0.0693)	(0.0831)	(0.0916)
Congenital anomalies	-0.0356	-0.00760	-0.0364	-0.0657	-0.0473	-0.0325
	(0.0938)	(0.121)	(0.0767)	(0.125)	(0.0961)	(0.139)
Perinatal	-0.114	-0.0798	-0.0231	0.0598	0.201	0.0867
	(0.110)	(0.135)	(0.124)	(0.145)	(0.162)	(0.181)
Infectious	-0.202	-0.321	-0.179	-0.189	-0.0840	-0.0722
	(0.174)	(0.192)	(0.152)	(0.184)	(0.158)	(0.169)
Respiratory	-0.181**	-0.196**	-0.182*	-0.217**	-0.144	-0.163
	(0.0784)	(0.0903)	(0.104)	(0.0954)	(0.106)	(0.118)
External	-0.488***	-0.229	-0.380**	-0.347	-0.256	-0.0376
	(0.129)	(0.177)	(0.179)	(0.207)	(0.194)	(0.242)
Digestive	0.125	0.128	0.122	0.119	0.134	0.239
	(0.267)	(0.299)	(0.273)	(0.313)	(0.323)	(0.376)
Deaths Ages 1 to 4 per 1000K Pop	-0.0863	-0.203***	-0.121	-0.163	-0.0789	-0.0767
	(0.0691)	(0.0706)	(0.0900)	(0.106)	(0.114)	(0.133)

Notes: The coefficients present the lower bound for the average treatment on the treated parameter for high-dose regions using equation (1) in percent changes. Data: 1978/79, 1988, 1989 and 1990.

Appendix A

Data Sources

<u>I. Data for RSFSR oblasts:</u>

A. Standardized death rate due to alcohol-related causes, 1978-1979

This is the average death rate over the years 1978-1979. It is age-standardized using the European population, and is measured as 1 death per 100,000 population. The alcohol-related causes are (Soviet code/ICD9 codes in parentheses) alcohol poisoning (163/860), alcoholic psychosis (73/291), chronic alcoholism (75/303), other psychoses (74/290, 292-302, 305-316), other diseases of the nervous system (83/330-337, 341-344, 346-380, 384-389), chronic liver disease and cirrhosis (122/571.0-571.3), other diseases of the liver and bile duct (125/570, 571.4, 571.8-573, 575.2-576), diseases of the pancreas (126/577), ill-defined conditions (159/780-796, 798, 799), other accidental poisoning (164/850-858, 861-869), suicide (173/950-959) and undetermined injury (175/980-989).

ICD9 = International Classification of Diseases, 9th revision.

Source: Russian Fertility and Mortality Database (RusFMD),
http://demogr.nes.ru/en/demogr_indicat.

B. Vital statistics: births, deaths, marriages, divorces, infant deaths

Vital statistics data are located in the RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)). The vital statistics in the archives are given as counts of (i) births (total, urban areas, rural areas; boys; girls; urban boys, rural boys; and urban girls, rural girls); (ii) deaths (total, urban areas, rural areas; men; women; urban men, rural men; and urban women, rural women); (iii) infant deaths (total, urban areas, rural areas; boys; girls; urban boys, rural boys; and urban girls, rural girls); (iv) and marriages and divorces (total, urban areas, rural areas). Vital statistics data for 1986 are not in the archives. The locations of the vital statistics data for 1981-1985 and 1987-1990 are (F. = Fond; op. = opis; d. = delo):

1981: RGAE F. 1562, op. 64, d. 1681
1982: RGAE F. 1562, op. 65, d. 1920
1983: RGAE F. 1562, op. 66, d. 2282
1984: RGAE F. 1562, op. 65, d. 1812
1985: RGAE F. 1562, op. 70, d. 1421
1987: RGAE F. 1562, op. 70, d. 4550
1988: RGAE F. 1562, op. 70. d. 5863
1989: RGAE F. 1562, op. 70. d. 7595
1990: RGAE F. 1562, op. 70, d. 8975

1986:

Births and infant deaths: provided to the authors directly from Rosstat (https://rosstat.gov.ru/).
Crude marriage rate (all population, urban population and rural population): *Nekotorie pokazateli demograficheskikh protsessov i sotsial'nogo razvitiya v RSFSR* (Goskomstat RSFSR 1990), pp. 125-133.
Crude divorce rate (all population, urban population and rural population): *Nekotorie pokazateli demograficheskikh protsessov i sotsial'nogo razvitiya v RSFSR* (Goskomstat RSFSR 1990), pp.135-143.
Crude death rate (all population, urban population and rural population): *Nekotorie pokazateli demograficheskikh protsessov i sotsial'nogo razvitiya v RSFSR* (Goskomstat RSFSR 1990), pp. 74-85.

C. Annual population

The sources below provide the annual population (by urban/rural but not by sex) as of Jan. 1 of each year.

1980: *Narodnoe khozyaistvo RSFSR v. 1979 g*. pp. 7-9
1981: *Naselenie SSSR v 1987 g*. pp. 16-23
1982: *Narodnoe khozyaistvo RSFSR v 1981 g*. pp. 6-8
1983: *Narodnoe khozyaistvo RSFSR v 1982 g*. pp. 6-8
1984: *Narodnoe khozyaistvo RSFSR v 1983 g.* pp. 6-8
1985: *Rossiiskii statisticheskii ezhegodnik 1999*, pp. 54-5.
1986: *Narodnoe khozyaistov RSFSR v 1985 g.* pp. 6-8
1987: *Naselenie SSSR v 1987 g.* pp. 16-23
1988: Interpolated from the 1987 and 1989 population data
1989: *Rossiiskii statisticheskii ezhegodnik 1999*, pp. 54-5.
1990: *Demograficheskii ezhegodnik SSSR 1990*, pp. 7-9.
1991: *Regiony rossii 1999* vol. 2, pp. 32-33.

D. Population of women of childbearing age

We use the 1989 census data to estimate the number of women ages 15 to 44 in every year from 1981 to 1989 by oblast. We use the procedure described by Appendix D of Malkova (2018).

E. Number of births by parity

We use the 2010 census data that asks every woman the year of her first birth and her oblast of birth. We use the procedure described by Appendix D of Malkova (2018).

F. Other oblast-level variables

Doctors per 10,000 population, hospital beds per 10,000 population:

1981-1985: *Narodnoe khozyaistvo RSFSR v 1985 g*., pp. 356-358; 362-364.
1986-1990: *Narodnoe khozyaistvo RSFSR v 1990 g*., pp. 278-283.

II. Monthly data for the RSFSR:

Monthly deaths, infant deaths (except 1986), births, marriages and divorces:

Alexandre Avdeev and Alain Monnier. 1996. *Mouvement de la population de la Russie 1959-1994: tableaux démographiques.* Institut national d'études démographiques (France).

Monthly infant deaths, 1986: provided to the authors directly from Rosstat (https://rosstat.gov.ru/).

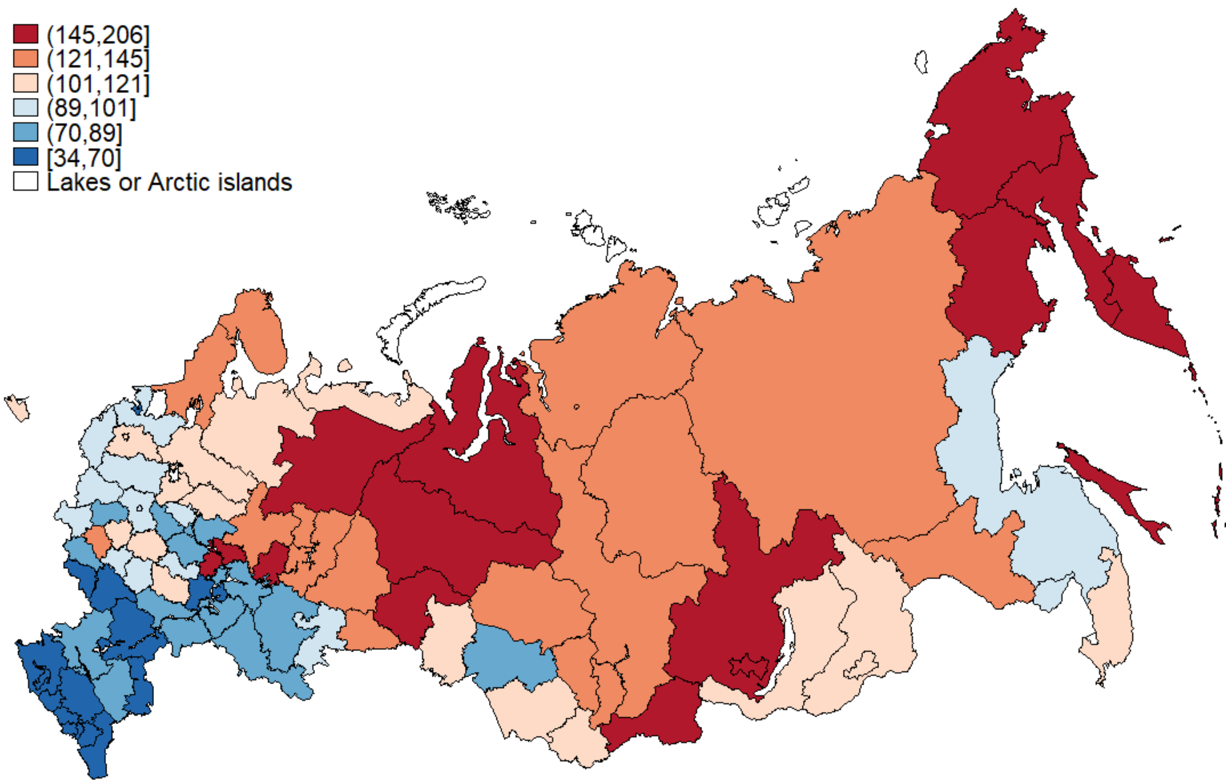
III. ICD9 codes for causes of death in Table 1:

Neoplasms: 140-165, 170-175, 179-208, 210-239
Circulatory diseases: 390-398, 401-405, 410-424, 430-438, 440-448. 451-459
Alcohol-related causes: 290-303, 305-316, 330-337, 341-344, 346-380, 384-389, 571.0-571.3, 570, 571.4, 571.8-573, 575.2-576, 577, 780-796, 798, 799, 850-858, 860, 861-869, 950-959 and 980-989.
External causes: 800-807, 810-848, 850-858, 860-888, 890-978, 980-999
    Accidental poisoning by alcohol: 860
    Homicide: 960-978
    Suicide: 950-959

Appendix B

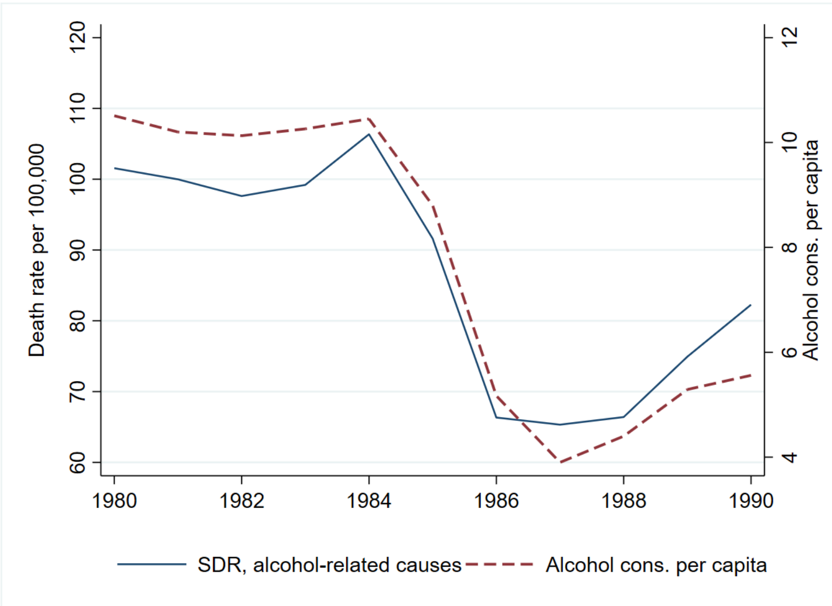
Figure and Tables

Figure B1. Pre-campaign SDR from Alcohol-related Causes across Russia's Oblasts



Notes: This map shows the distribution of SDR from alcohol-related causes in Russia in 1978/1979 across Russian oblasts. SDR is measured as 1 death per 100,000 population.

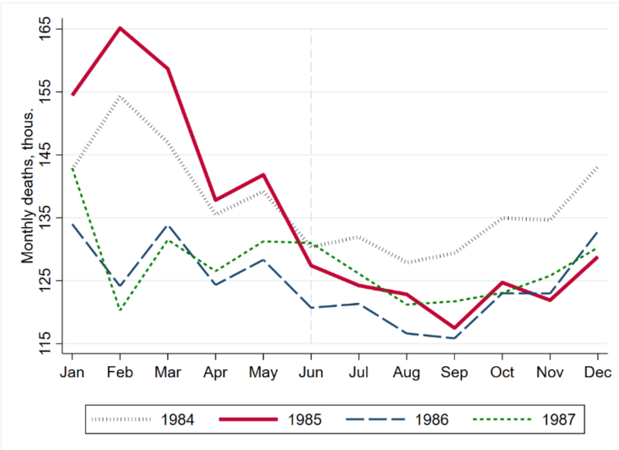
Figure B2. Official Alcohol Consumption and Alcohol Related Mortality over Time



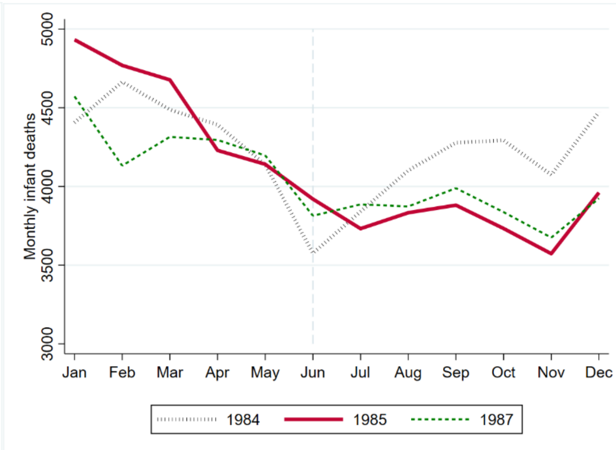
Notes: We graph official alcohol consumption per capita and the standardized mortality rate from alcohol related causes. Sources: Nemtsov (2011) and Russian Fertility and Mortality Database.

Figure B3. Monthly Outcomes over Time

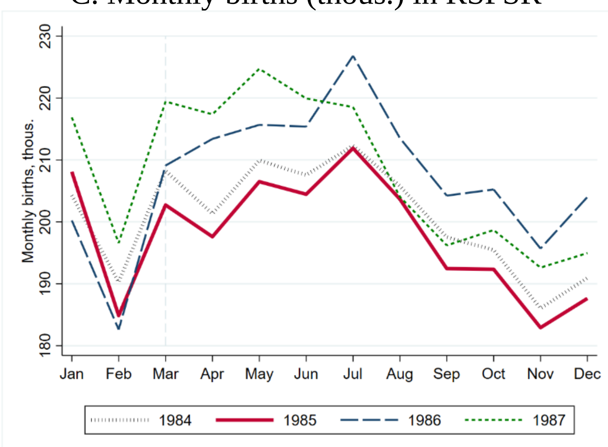
A. Monthly deaths (thous.) in RSFSR



B. Monthly infant deaths



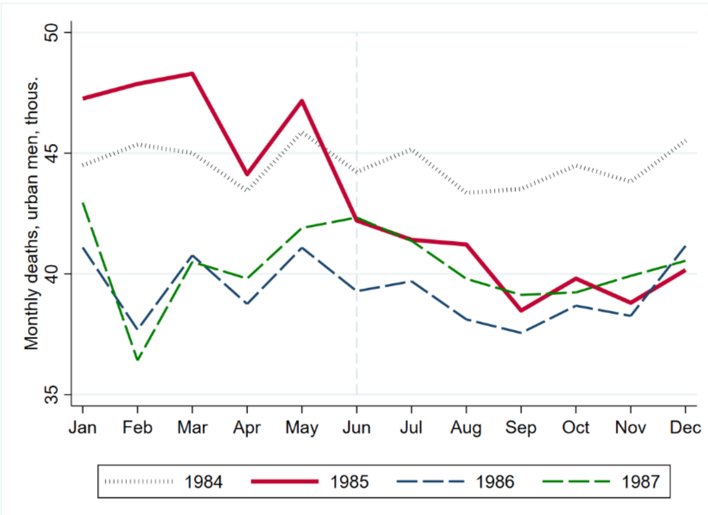
C. Monthly births (thous.) in RSFSR



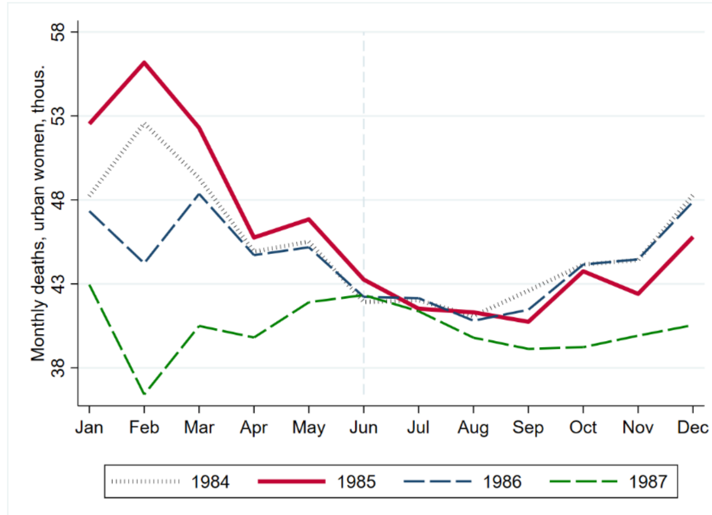
Notes: Monthly infant deaths from 1986 are unavailable. Sources: Avdeev and Monnier 1996; Rosstat.

Figure B4. Monthly Deaths over Time: Urban vs. Rural

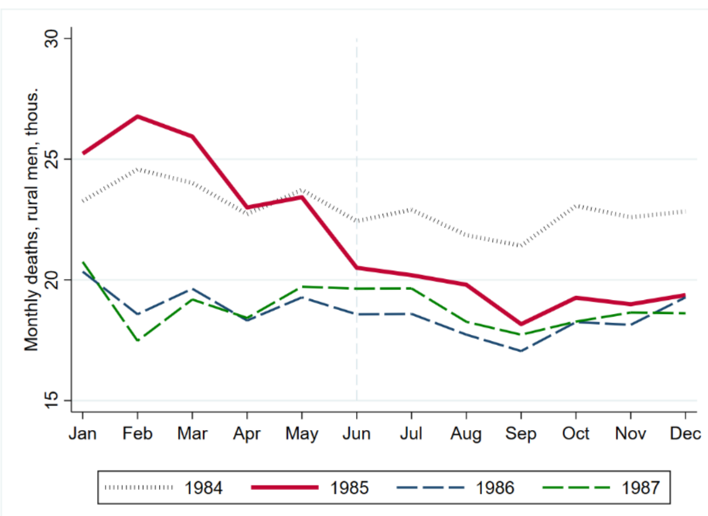
A. Urban men



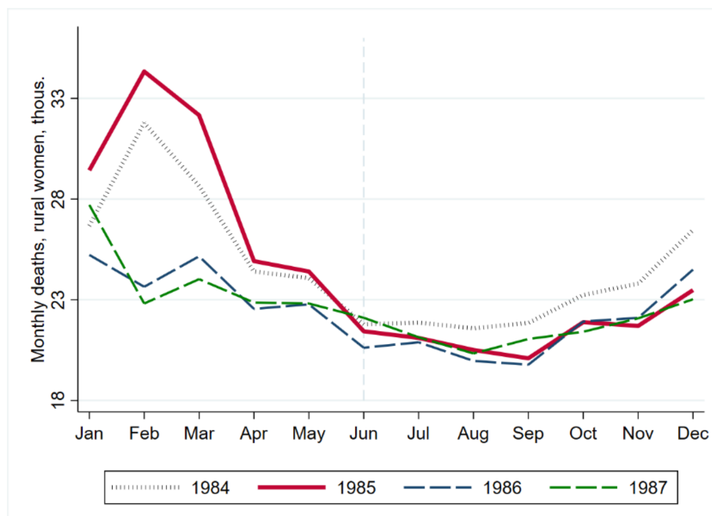
B. Urban women



C. Rural men



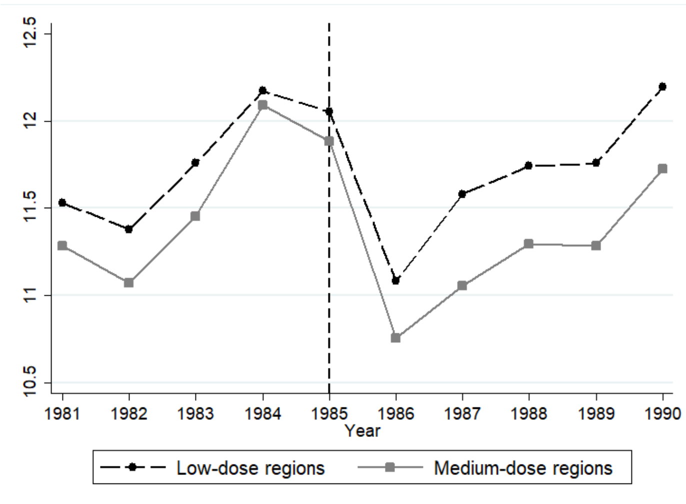
D. Rural women



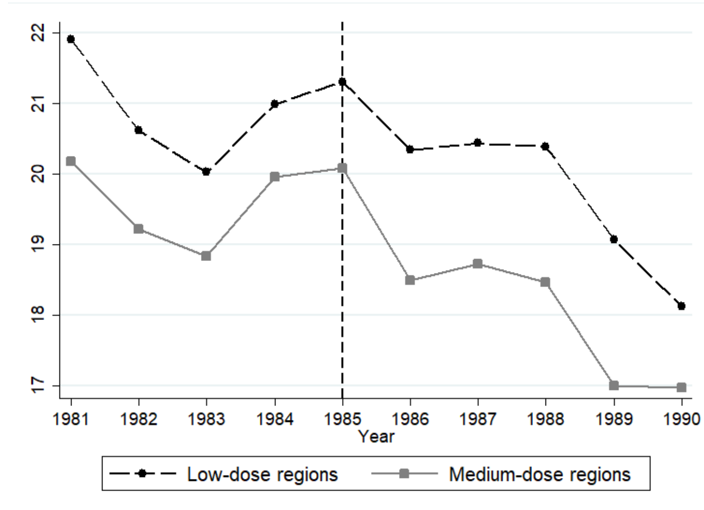
Notes: The graphs present the monthly deaths (in thousands) for urban men, urban women, rural men and rural women. Source: Avdeev and Monnier 1996.

Figure B5. Outcomes by Precampaign SDR: Low-dose vs. Medium-dose Regions

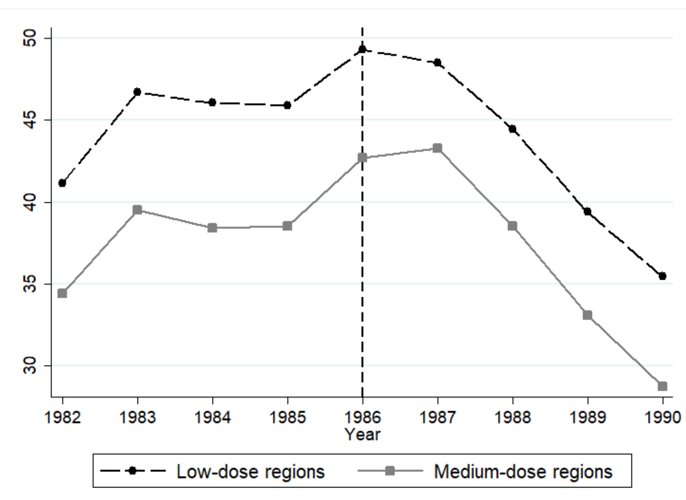
A. Crude Death Rate



B. Infant Mortality Rate



C. GFR for Higher Order Births



D. Crude Divorce Rate

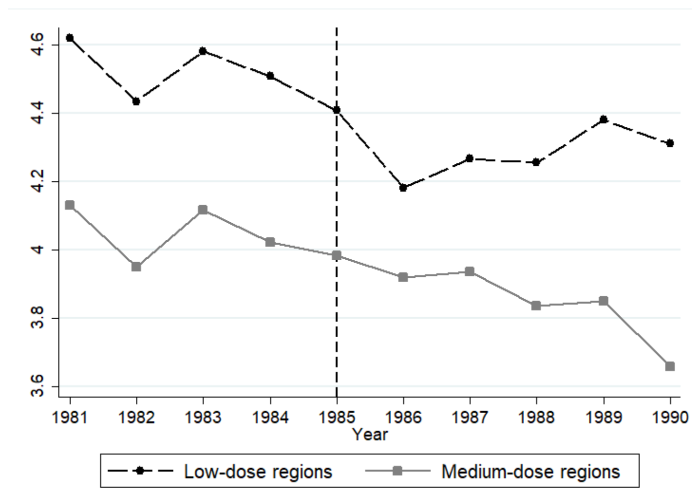
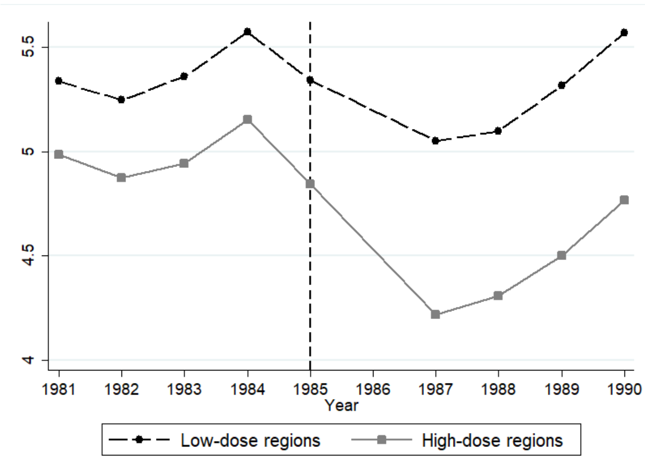
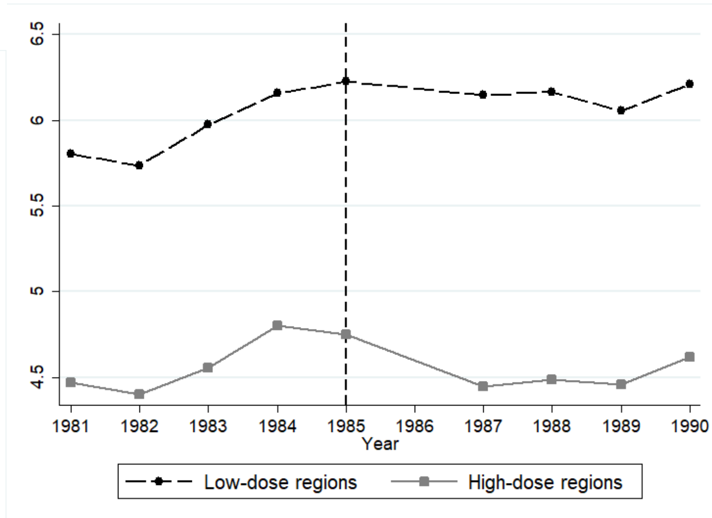


Figure B6. Crude Death Rates by Treatment Dose: Low-dose vs. High-dose

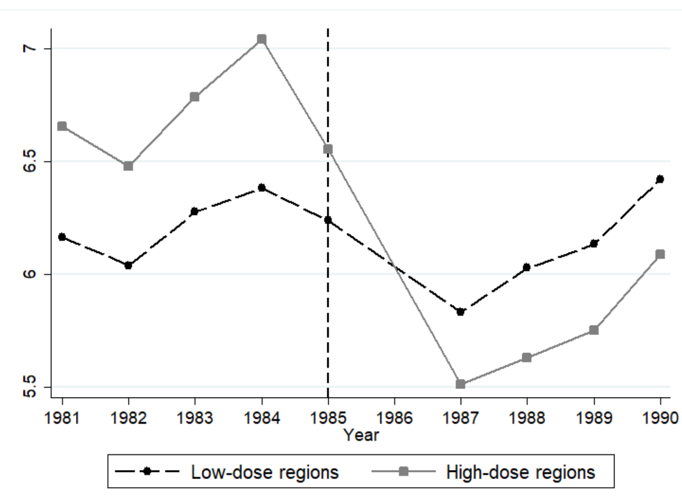
A. Urban men



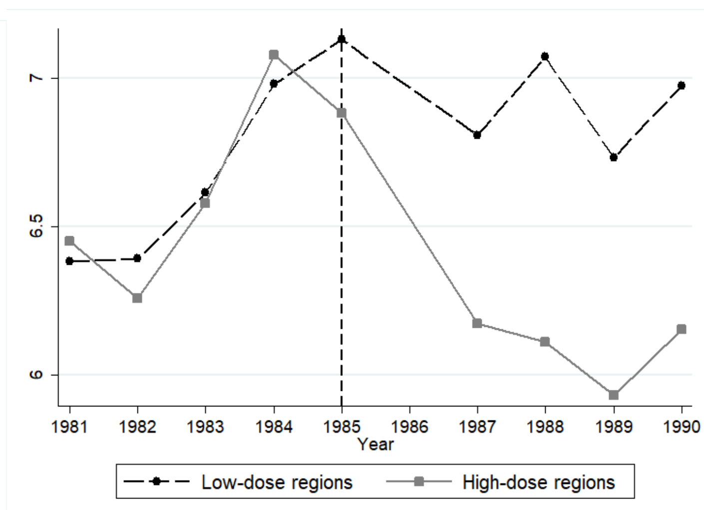
B. Urban women



C. Rural men



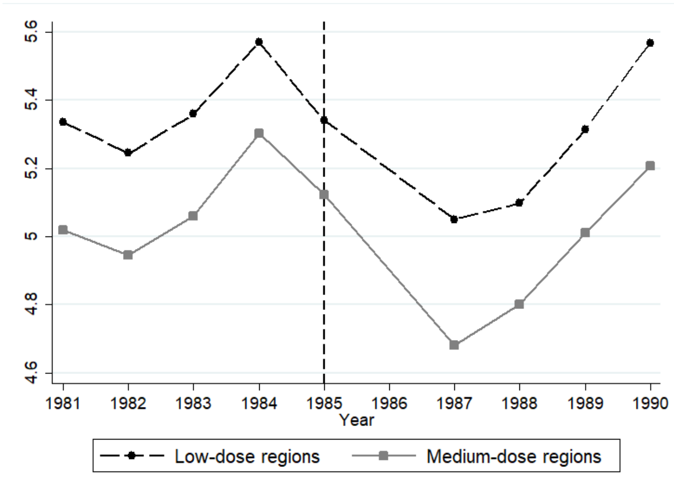
D. Rural women



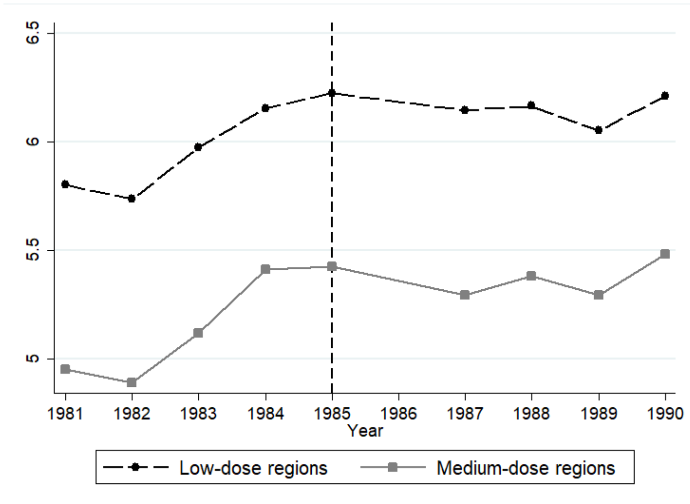
Notes: We plot the crude death rates for low-dose and high-dose oblasts based on their values of the 1978/79 alcohol-related SDR. Sources: Russian Fertility and Mortality database (alcohol-related SDR); RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)); *Narodnoe khoziastvo v RSFSR* (*National Economy of the RSFSR*), various issues; see Appendix A for details.

Figure B7. Crude Death Rates by Treatment Dose: Low-dose vs. Medium-dose

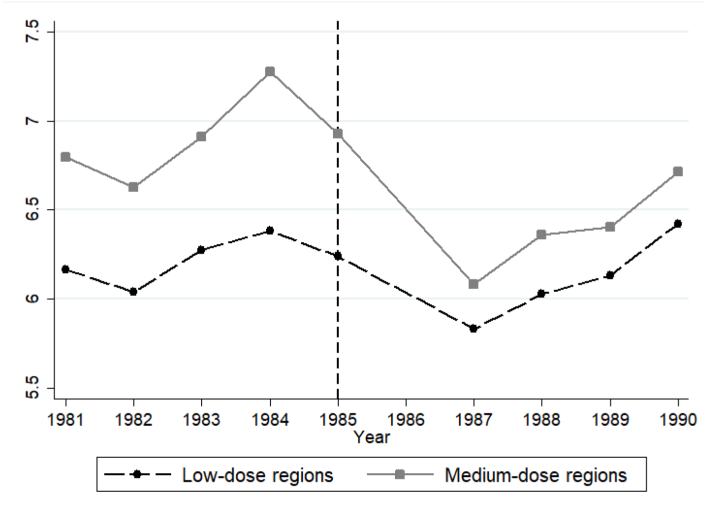
A. Urban men



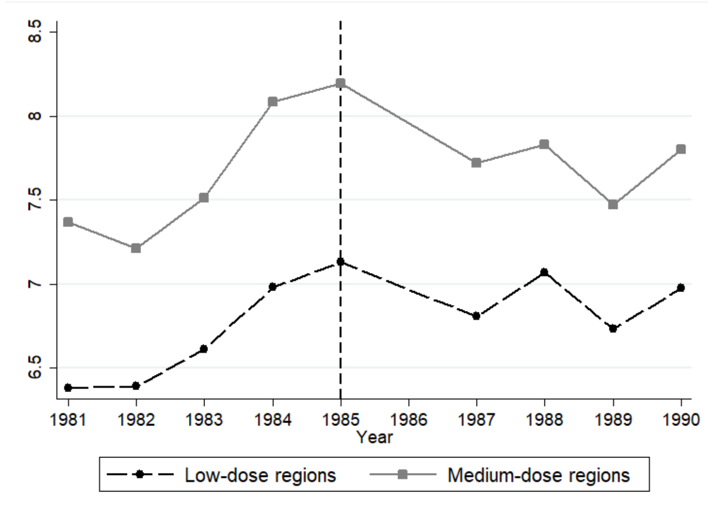
B. Urban women



C. Rural men



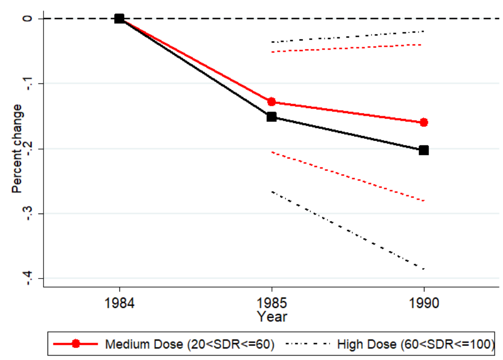
D. Rural women



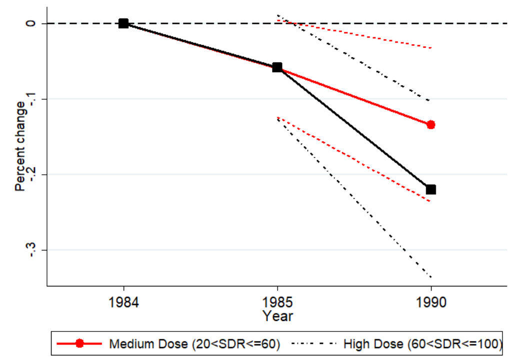
Notes: Sources: We plot the crude death rates for low-dose and high-dose oblasts based on their values of the 1978/79 alcohol-related SDR. Russian Fertility and Mortality database (alcohol-related SDR); RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)); *Narodnoe khoziastvo v RSFSR* (*National Economy of the RSFSR*), various issues; see Appendix A for details.

Figure B8. Effect of the Campaign on Official Alcohol Consumption by Type

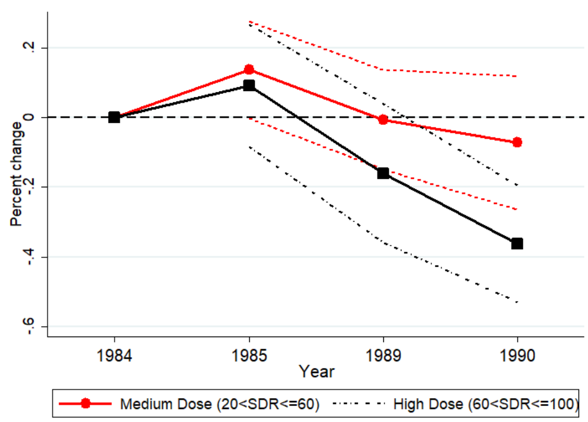
A. Hard alcohol



B. Vodka



C. Wine



D. Beer

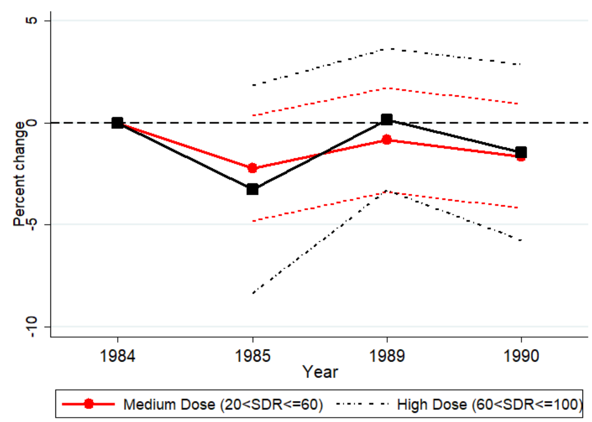
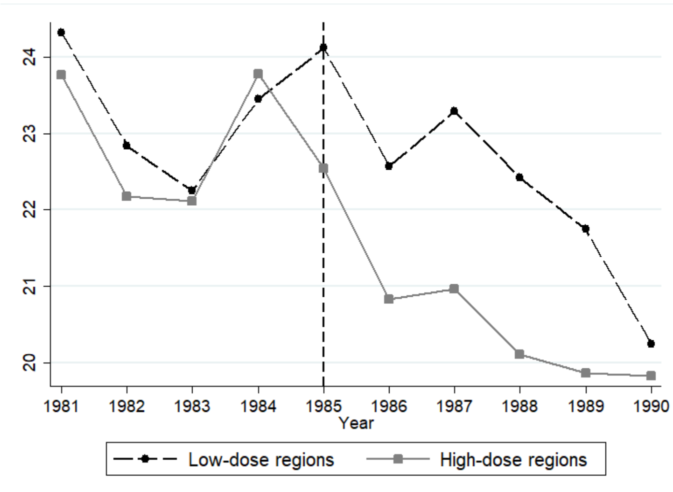
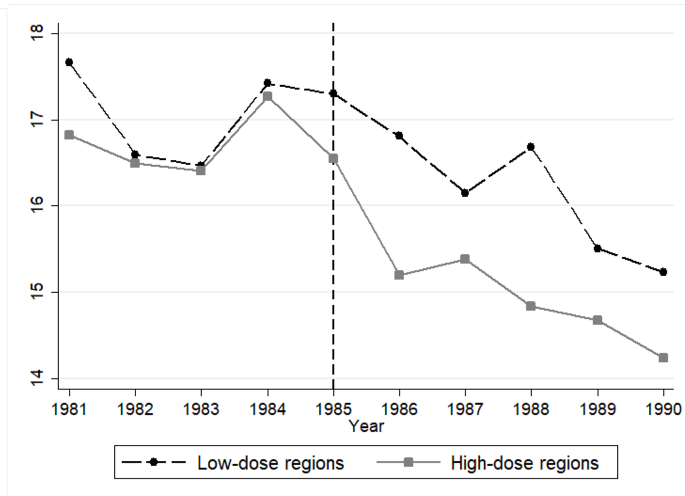


Figure B9. IMR by Precampaign SDR: Low-dose vs. High-dose Regions

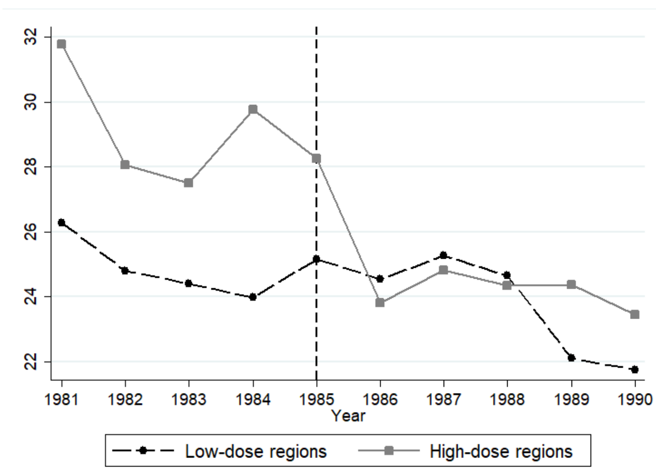
A. Urban boys



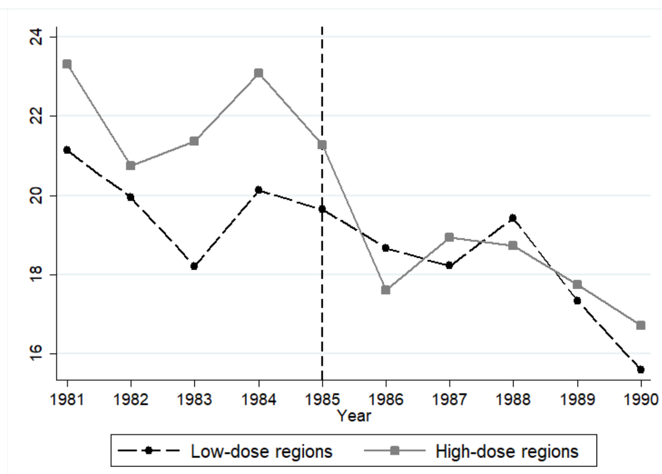
B. Urban girls



C. Rural boys



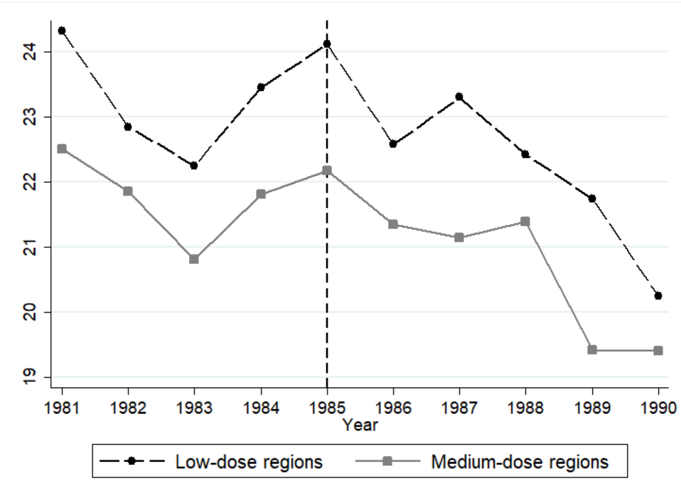
D. Rural girls



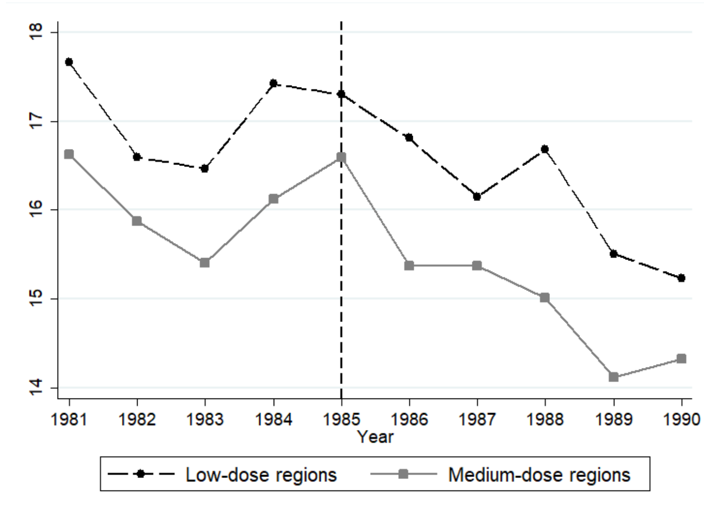
Notes: We plot the infant mortality rates for low-dose and high-dose oblasts based on their values of the 1978/79 alcohol-related SDR. Sources: Russian Fertility and Mortality database (alcohol-related SDR); RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)); Rosstat; see Appendix A for details.

Figure B10. IMR by Precampaign SDR: Low-dose vs. Medium-dose Regions

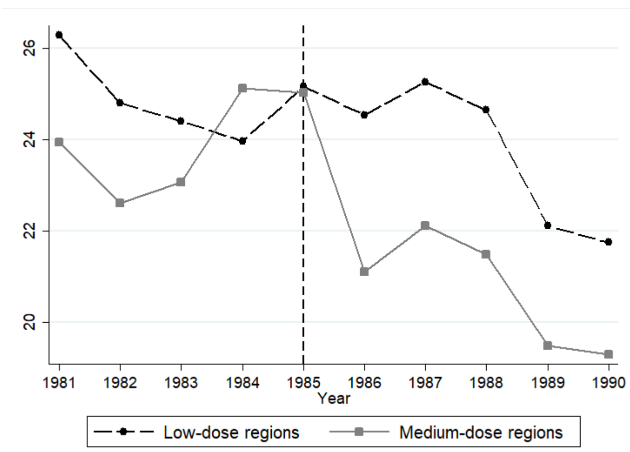
A. Urban boys



B. Urban girls



C. Rural boys



D. Rural girls

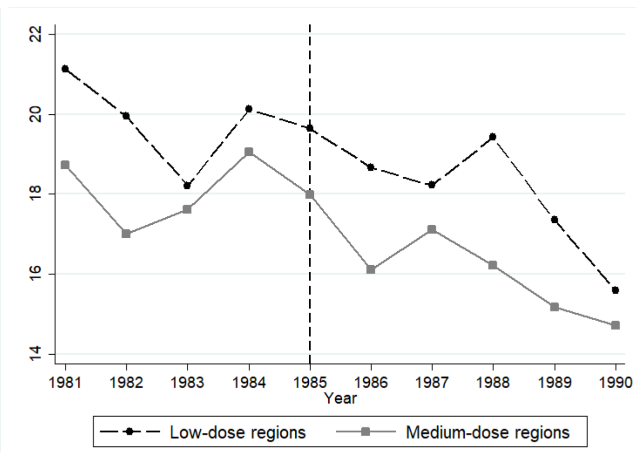
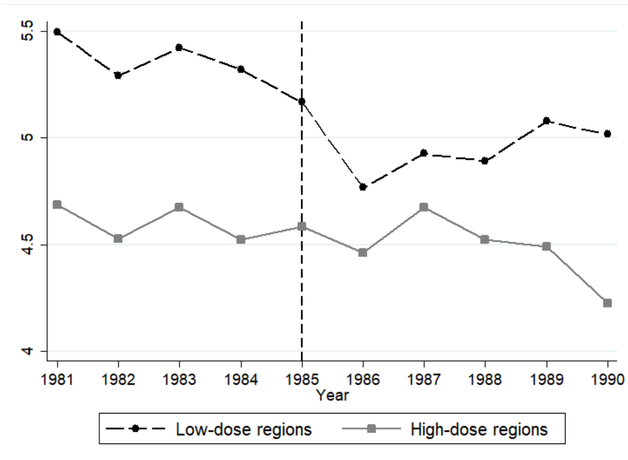
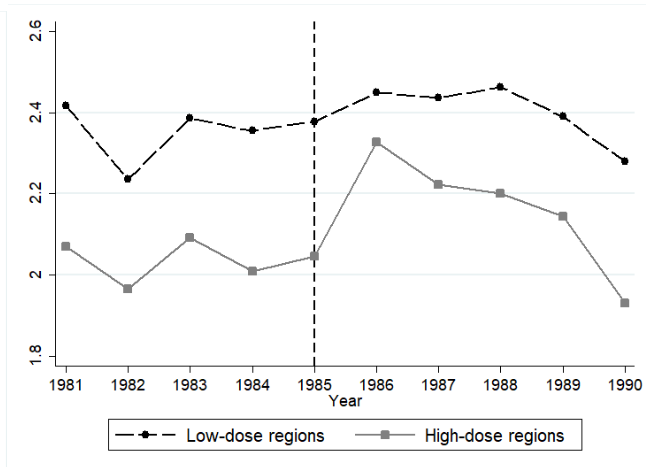


Figure B11. Divorce and Marriage by Precampaign SDR: Low-dose vs. High-dose Regions

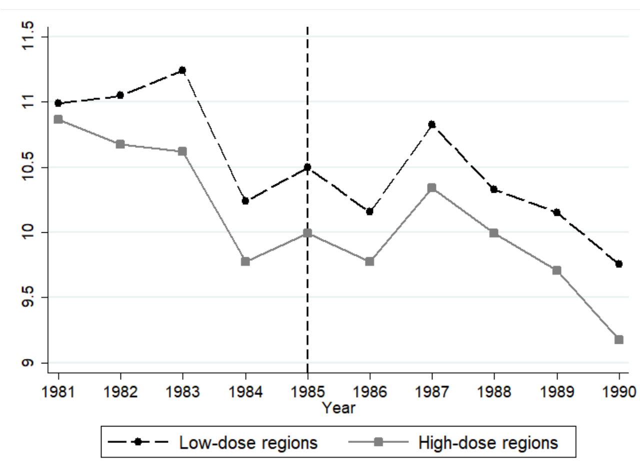
A. Urban Divorce Rate



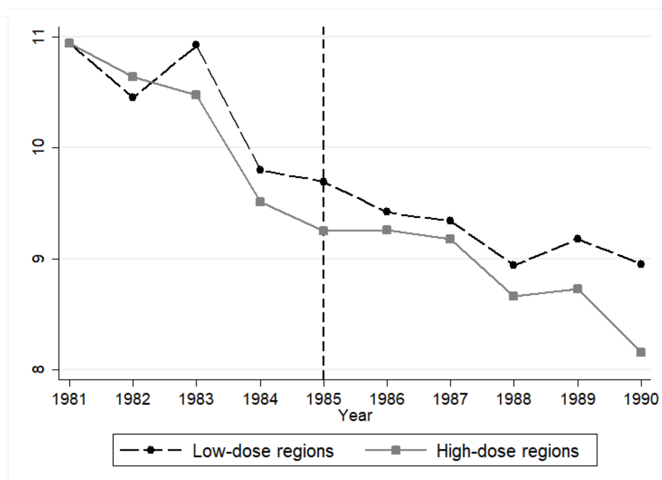
B. Rural Divorce Rate



C. Urban Marriage Rate



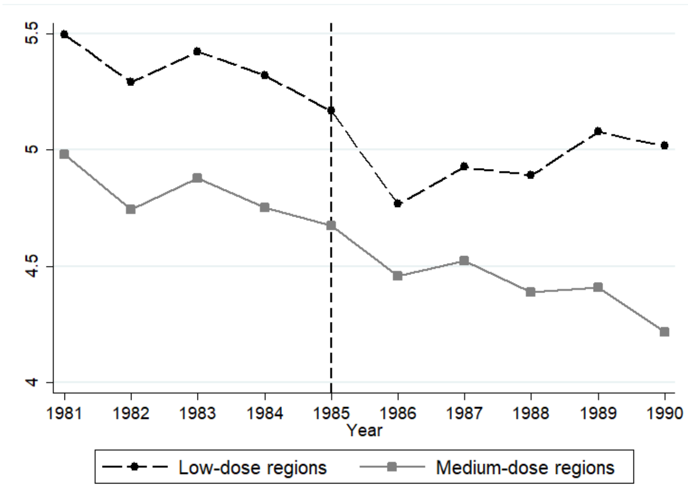
D. Rural Marriage Rate



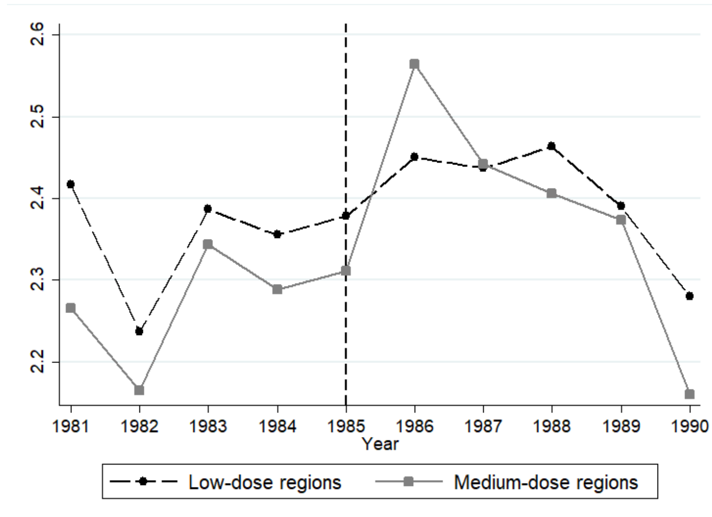
Notes: We plot the crude marriage rates for low-dose and high-dose oblasts based on their values of the 1978/79 alcohol-related SDR.. Sources: Russian Fertility and Mortality database (alcohol-related SDR); RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)); *Narodnoe khoziastvo v RSFSR* (*National Economy of the RSFSR*), various issues; *Nekotorie pokazateli demograficheskikh protsessov i sotsial'nogo razvitiya v RSFSR* (Goskomstat RSFSR 1990). See Appendix A for details.

Figure B12. Divorce and Marriage by Precampaign SDR: Low-dose vs. Medium-dose Regions

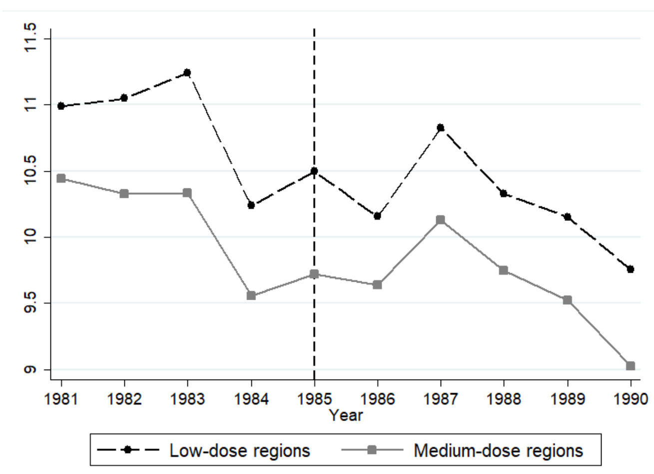
A. Urban Divorce Rate



B. Rural Divorce Rate



C. Urban Marriage Rate



D. Rural Marriage Rate

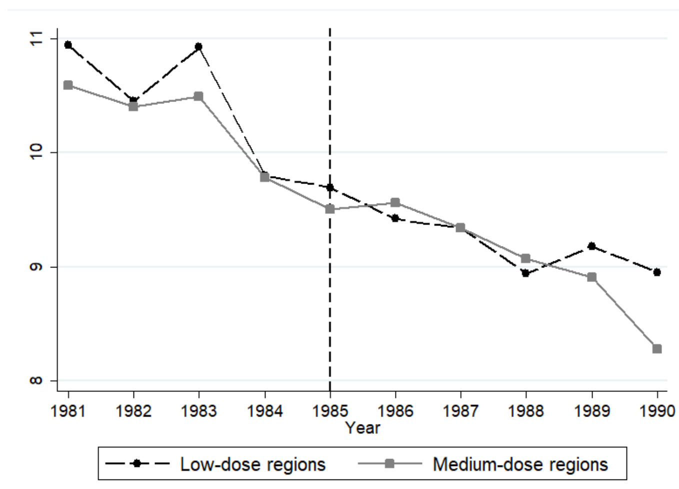
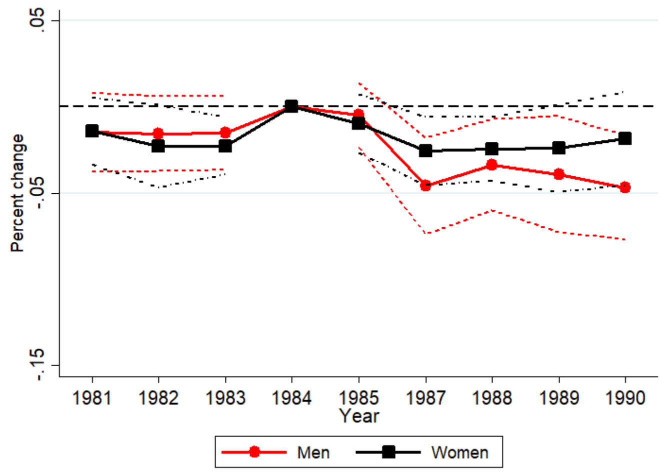
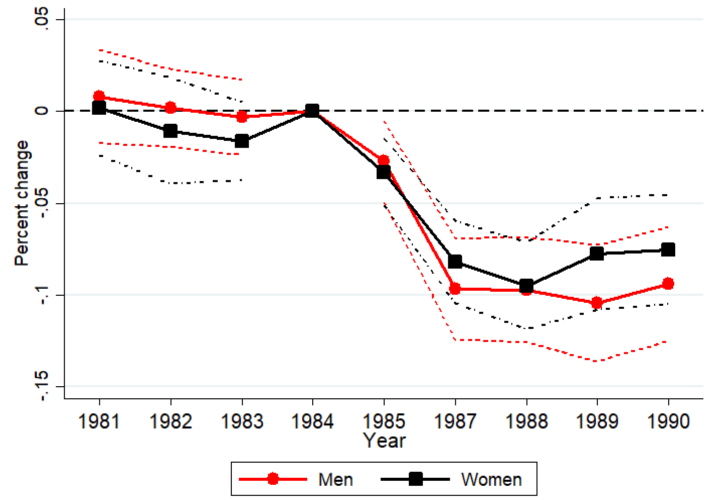


Figure B13. Effect of the Campaign on Mortality and Infant Mortality Rate by Sex

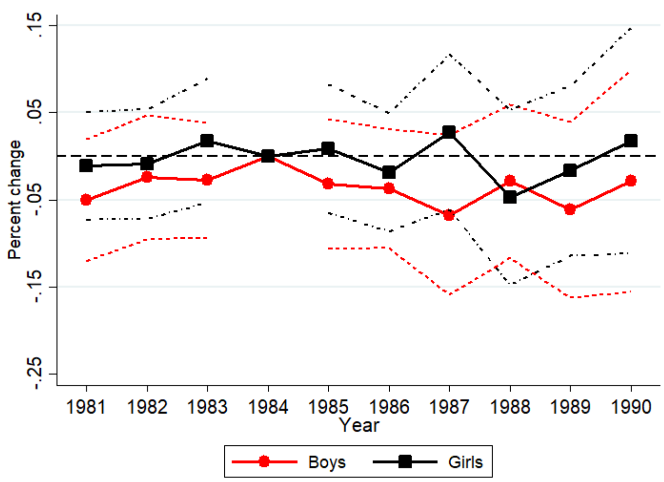
A. Crude Death Rate (medium-dose)



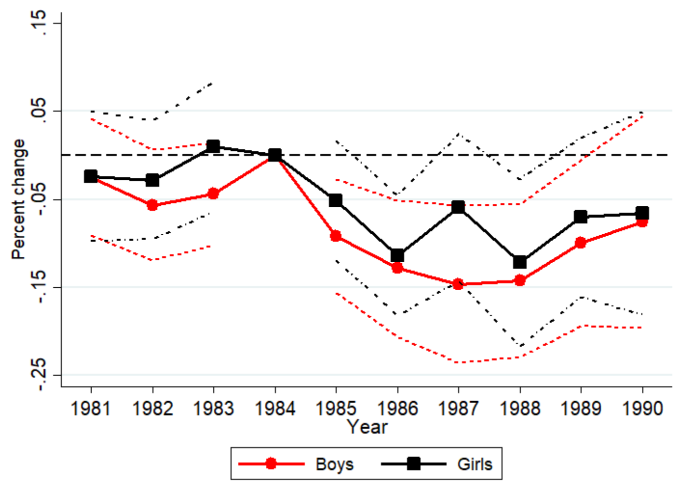
B. Crude Death Rate (high-dose)



C. Infant Mortality Rate (medium-dose)



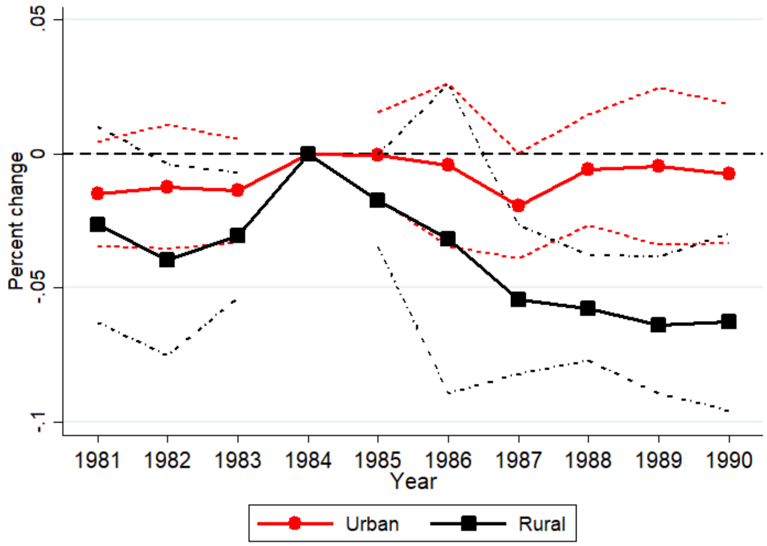
D. Infant Mortality Rate (high-dose)



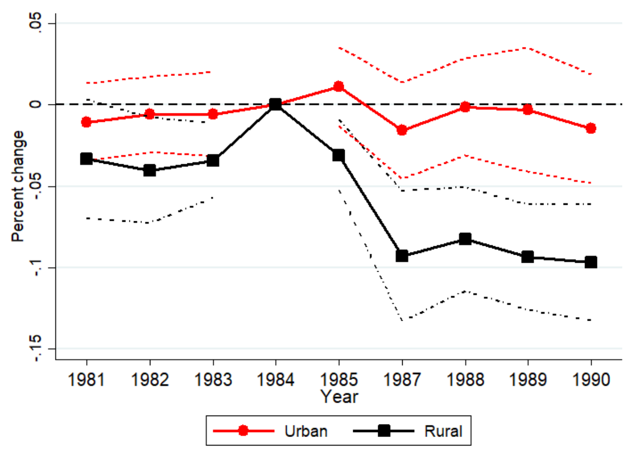
Notes: The coefficients starting from the year 1985 present the lower bound of the effect of the anti-alcohol campaign by sex on crude death rates (panels A and B), and infant mortality rates (panels C and D) in percent changes. We cluster standard errors at the oblast level. Dashed lines construct 95-percent, point-wide confidence intervals. Sources: Sources: Russian Fertility and Mortality database (alcohol-related SDR); RGAE archive (Rossiiskii gosudarstvennyi arkhiv ekonomiki (Russian State Archive of the Economy)); Rosstat; see Appendix A for details.

Figure B14. Effect of the Campaign on Crude Death Rates for Medium-dose Regions

A. RSFSR (medium-dose)



B. Men (medium-dose)



C. Women (medium-dose)

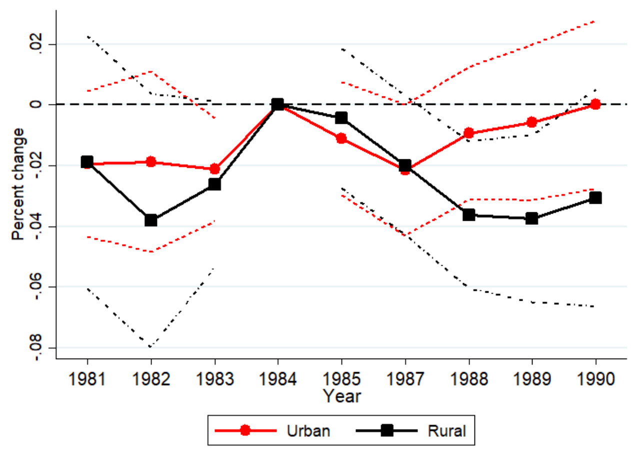
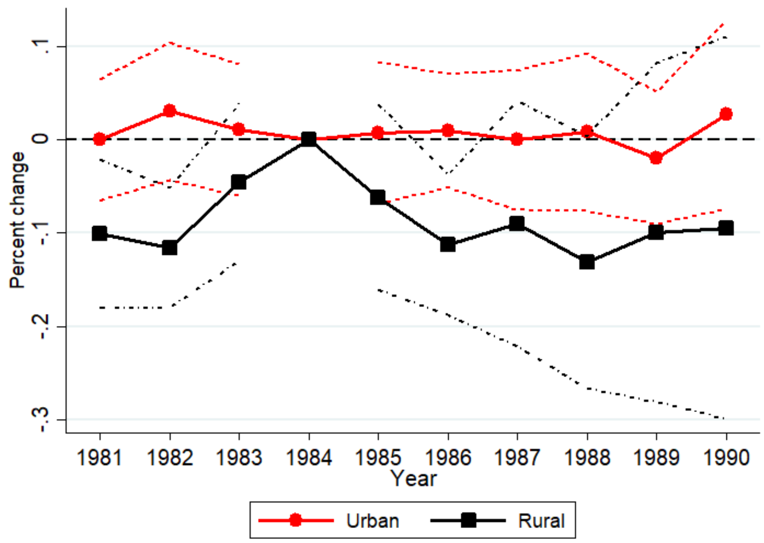
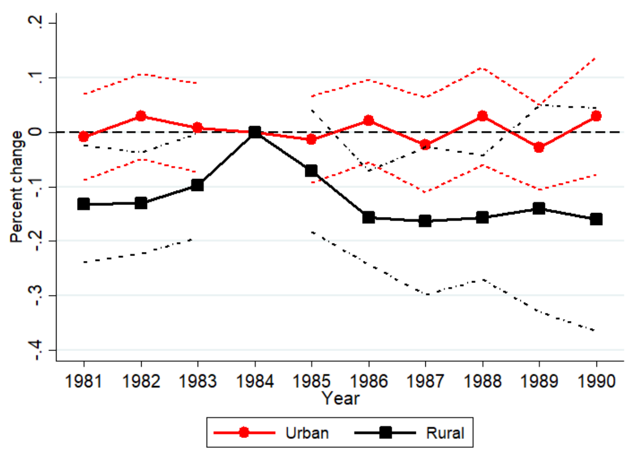


Figure B15. Effect of the Campaign on Infant Mortality Rates for Medium-dose Regions

A. RSFSR (medium-dose)



B. Boys (medium-dose)



C. Girls (medium-dose)

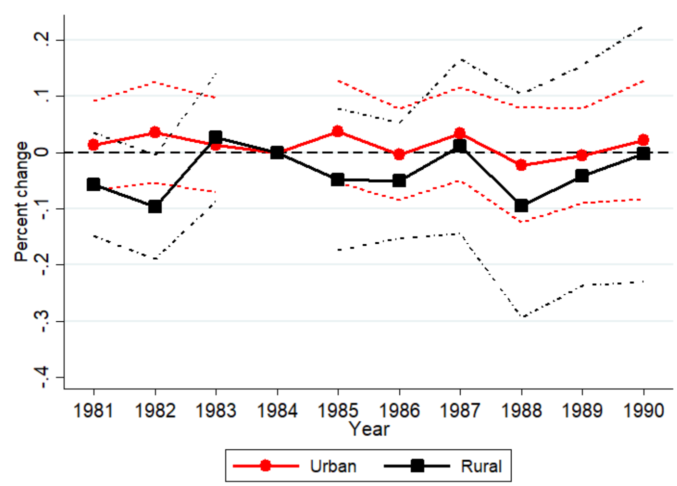
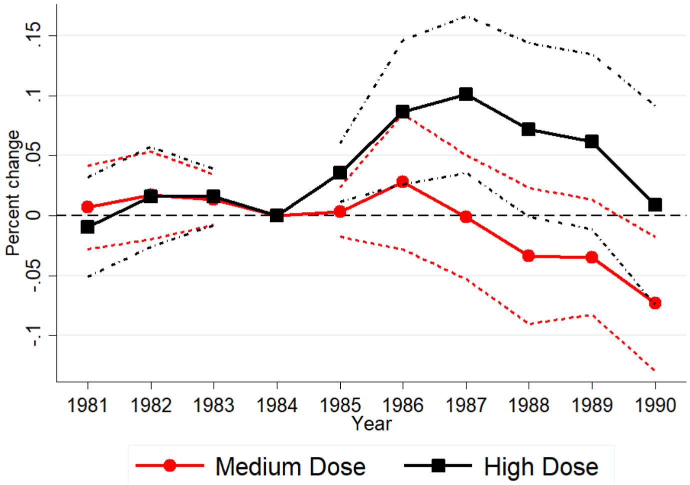
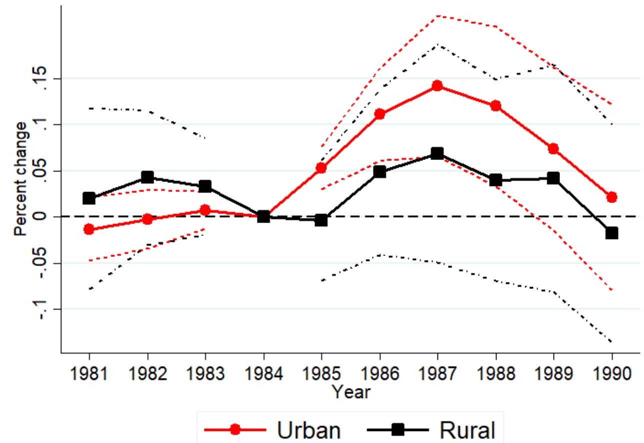


Figure B16. Effect of the Anti-alcohol Campaign on Adjusted Divorce and Marriage Rates

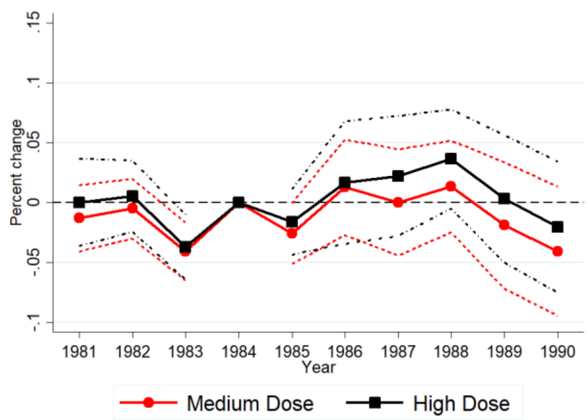
A. Adj. Divorce rate in RSFSR



B. Adj. Divorce rate (high-dose)



C. Adj. Marriage rate in RSFSR



D. Adj. Marriage rate (high-dose)

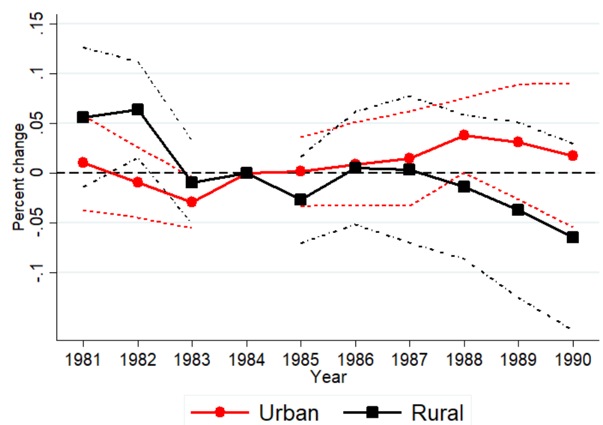


Figure B17. Effect of the Campaign on Marriage and Divorce rates for Medium-dose Regions

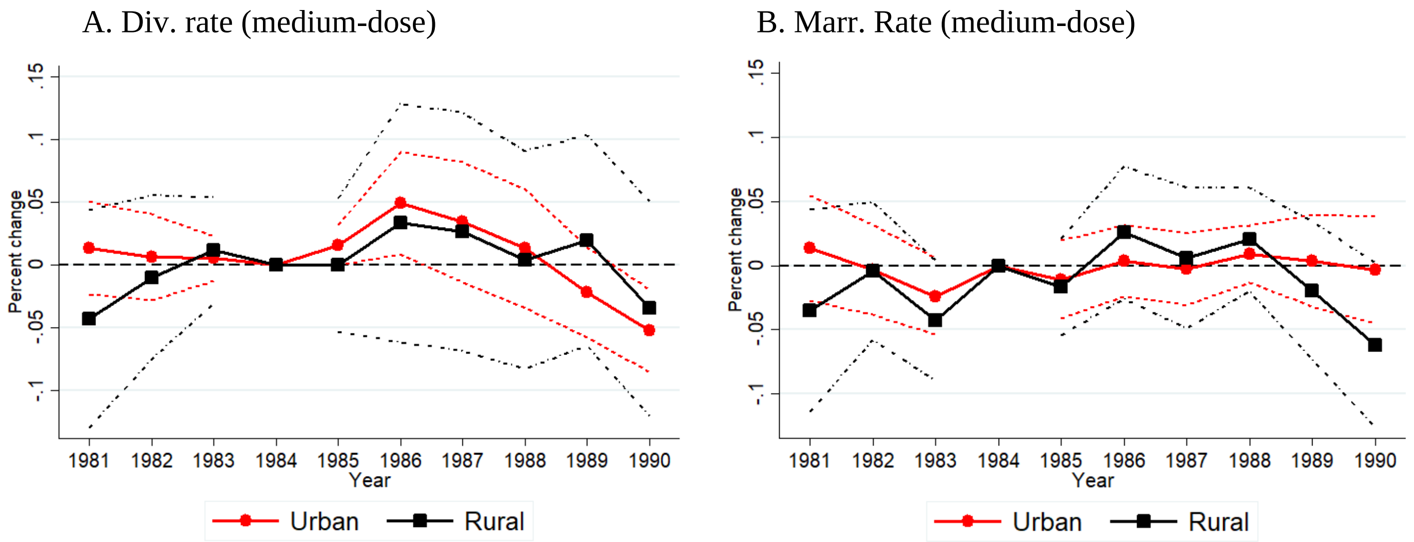


Table B1. Effect of the Campaign by Age and Sex: High+Medium vs. Low-Dose Regions

	1985/86		1988		1989		1990	
Ages	men	women	men	women	men	women	men	women
5 to 9	0.158	0.0639	0.180	0.111	0.236*	0.200**	0.253*	0.0629
	(0.116)	(0.104)	(0.115)	(0.100)	(0.129)	(0.0796)	(0.135)	(0.120)
10 to 14	-0.0499	0.0159	-0.0519	0.122	-0.00298	0.0732	0.0331	0.0907
	(0.0801)	(0.0929)	(0.0837)	(0.114)	(0.0768)	(0.0997)	(0.0764)	(0.115)
15 to 19	0.00944	-0.0540	-0.0825	0.0882	-0.0424	0.0904	-0.0317	0.0477
	(0.0531)	(0.0757)	(0.0649)	(0.0645)	(0.0588)	(0.0798)	(0.0609)	(0.0837)
20 to 24	-0.0301	-0.165***	-0.130***	-0.0878	-0.113***	-0.107**	-0.0929**	-0.119*
	(0.0294)	(0.0608)	(0.0439)	(0.0661)	(0.0386)	(0.0433)	(0.0387)	(0.0599)
25 to 29	-0.123***	-0.109**	-0.133***	-0.164**	-0.158***	-0.153***	-0.140***	-0.0840
	(0.0329)	(0.0414)	(0.0414)	(0.0702)	(0.0400)	(0.0471)	(0.0362)	(0.0544)
30 to 34	-0.0617*	-0.133***	-0.131***	-0.177***	-0.105**	-0.163***	-0.102*	-0.149***
	(0.0346)	(0.0464)	(0.0419)	(0.0535)	(0.0413)	(0.0527)	(0.0517)	(0.0484)
35 to 39	-0.0839**	-0.190***	-0.0967**	-0.199***	-0.101**	-0.222***	-0.0995***	-0.177***
	(0.0340)	(0.0557)	(0.0400)	(0.0627)	(0.0389)	(0.0600)	(0.0370)	(0.0608)
40 to 44	-0.0704***	-0.0474	-0.0982***	-0.0623	-0.0962***	-0.0710*	-0.105***	-0.109**
	(0.0254)	(0.0290)	(0.0299)	(0.0394)	(0.0298)	(0.0420)	(0.0300)	(0.0422)
45 to 49	-0.0910***	-0.105***	-0.0751**	-0.114**	-0.0969***	-0.101***	-0.112***	-0.118***
	(0.0242)	(0.0330)	(0.0312)	(0.0447)	(0.0344)	(0.0380)	(0.0372)	(0.0420)
50 to 54	-0.0357*	-0.0665***	-0.0421*	-0.102***	-0.0683***	-0.107***	-0.0774***	-0.0924***
	(0.0198)	(0.0212)	(0.0236)	(0.0340)	(0.0256)	(0.0320)	(0.0262)	(0.0307)
55 to 59	-0.0530**	-0.0490**	-0.0472	-0.0548	-0.0748**	-0.0588	-0.0809**	-0.0735**
	(0.0232)	(0.0212)	(0.0293)	(0.0364)	(0.0295)	(0.0360)	(0.0345)	(0.0300)
60 to 64	-0.0797***	-0.0395	-0.0437**	-0.0372	-0.0603***	-0.0482**	-0.0409	-0.0381
	(0.0154)	(0.0249)	(0.0200)	(0.0315)	(0.0206)	(0.0225)	(0.0251)	(0.0243)
65 to 69	-0.0855***	-0.0457**	-0.0366*	-0.0442**	-0.0538**	-0.0188	-0.0598***	-0.00689
	(0.0176)	(0.0201)	(0.0184)	(0.0216)	(0.0215)	(0.0207)	(0.0202)	(0.0237)
70 to 74	-0.0267	-0.0112	-0.0542**	0.00366	-0.0580**	-0.0151	-0.0700***	-0.0358
	(0.0223)	(0.0176)	(0.0268)	(0.0309)	(0.0244)	(0.0231)	(0.0189)	(0.0244)
75 to 79	-0.0262	0.000559	-0.0558**	-0.0228	-0.0722***	-0.0195	-0.0641***	-0.0261
	(0.0264)	(0.0215)	(0.0246)	(0.0226)	(0.0235)	(0.0234)	(0.0241)	(0.0194)

Notes:

Table B2. Effect of the Campaign on Crude Death Rates by Age and Sex: High vs. Low-Dose Regions

	1985/86		1988		1989		1990	
Ages	**men**	**women**	**men**	**women**	**men**	**women**	**men**	**women**
5 to 9	0.102	0.0288	0.0958	0.0491	0.165	0.154	0.169	0.0561
	(0.114)	(0.105)	(0.121)	(0.118)	(0.128)	(0.0943)	(0.138)	(0.138)
10 to 14	-0.124	-0.104	-0.153	-0.0457	-0.141	-0.136	-0.0748	-0.0735
	(0.113)	(0.114)	(0.121)	(0.131)	(0.124)	(0.107)	(0.122)	(0.134)
15 to 19	-0.0385	-0.158*	-0.199***	-0.0208	-0.120	-0.0359	-0.0831	-0.109
	(0.0766)	(0.0811)	(0.0638)	(0.0762)	(0.0754)	(0.0828)	(0.0713)	(0.0871)
20 to 24	-0.0612	-0.214***	-0.218***	-0.199***	-0.189***	-0.166***	-0.145***	-0.132**
	(0.0365)	(0.0602)	(0.0393)	(0.0596)	(0.0383)	(0.0525)	(0.0415)	(0.0637)
25 to 29	-0.185***	-0.173***	-0.236***	-0.294***	-0.245***	-0.235***	-0.202***	-0.190***
	(0.0266)	(0.0407)	(0.0340)	(0.0631)	(0.0332)	(0.0437)	(0.0321)	(0.0527)
30 to 34	-0.128***	-0.184***	-0.222***	-0.290***	-0.202***	-0.271***	-0.181***	-0.212***
	(0.0338)	(0.0575)	(0.0380)	(0.0629)	(0.0363)	(0.0679)	(0.0523)	(0.0562)
35 to 39	-0.146***	-0.296***	-0.171***	-0.339***	-0.181***	-0.358***	-0.174***	-0.288***
	(0.0335)	(0.0528)	(0.0367)	(0.0608)	(0.0365)	(0.0580)	(0.0379)	(0.0607)
40 to 44	-0.140***	-0.137***	-0.179***	-0.209***	-0.182***	-0.205***	-0.176***	-0.220***
	(0.0281)	(0.0348)	(0.0268)	(0.0396)	(0.0226)	(0.0408)	(0.0274)	(0.0413)
45 to 49	-0.178***	-0.193***	-0.189***	-0.235***	-0.228***	-0.212***	-0.219***	-0.236***
	(0.0264)	(0.0302)	(0.0288)	(0.0409)	(0.0314)	(0.0421)	(0.0355)	(0.0417)
50 to 54	-0.106***	-0.123***	-0.134***	-0.198***	-0.159***	-0.218***	-0.164***	-0.202***
	(0.0235)	(0.0295)	(0.0257)	(0.0376)	(0.0264)	(0.0364)	(0.0303)	(0.0331)
55 to 59	-0.115***	-0.116***	-0.120***	-0.150***	-0.160***	-0.165***	-0.157***	-0.172***
	(0.0239)	(0.0235)	(0.0294)	(0.0358)	(0.0280)	(0.0316)	(0.0350)	(0.0312)
60 to 64	-0.121***	-0.0923***	-0.111***	-0.114***	-0.117***	-0.121***	-0.101***	-0.102***
	(0.0204)	(0.0275)	(0.0205)	(0.0327)	(0.0209)	(0.0261)	(0.0264)	(0.0266)
65 to 69	-0.148***	-0.103***	-0.109***	-0.104***	-0.132***	-0.0840***	-0.136***	-0.0779***
	(0.0234)	(0.0301)	(0.0198)	(0.0261)	(0.0234)	(0.0292)	(0.0236)	(0.0278)
70 to 74	-0.0395	-0.0274	-0.0927***	-0.0423	-0.0957***	-0.0500**	-0.102***	-0.0811***
	(0.0282)	(0.0222)	(0.0296)	(0.0321)	(0.0275)	(0.0227)	(0.0217)	(0.0260)
75 to 79	-0.0475	-0.0283	-0.0722**	-0.0691**	-0.108***	-0.0640**	-0.0955***	-0.0784***
	(0.0303)	(0.0252)	(0.0307)	(0.0292)	(0.0288)	(0.0285)	(0.0328)	(0.0274)

Notes: The coefficients plot the lower bound of the effect of the anti-alcohol campaign on crude death rates in high-dose regions (in percent changes) using equation (1) by 5-year age groups. Data: 1978/79, 1985/86, 1988, 1989 and 1990.

Table B3. Effect of the Campaign by Cause: High+Medium vs. Low Dose Regions

	1988		1989		1990	
Causes	**men**	**women**	**men**	**women**	**men**	**women**
Alc. Related	-0.267***	-0.291***	-0.279***	-0.291***	-0.298***	-0.290***
	(0.0402)	(0.0573)	(0.0426)	(0.0591)	(0.0618)	(0.0720)
Infectious	-0.119**	-0.143	-0.149**	-0.109	-0.0980	-0.0427
	(0.0594)	(0.0908)	(0.0675)	(0.0898)	(0.0694)	(0.0874)
Respiratory	-0.142***	-0.156***	-0.166***	-0.166***	-0.147***	-0.156***
	(0.0381)	(0.0410)	(0.0352)	(0.0475)	(0.0437)	(0.0573)
Circulatory	-0.00485	-0.00158	-0.0438*	-0.0158	-0.0468**	-0.0176
	(0.0195)	(0.0196)	(0.0251)	(0.0215)	(0.0226)	(0.0185)
incl. Isch. Heart dis.	-0.0620	-0.0916*	-0.112**	-0.120**	-0.113***	-0.141***
	(0.0402)	(0.0524)	(0.0470)	(0.0571)	(0.0373)	(0.0467)
External	-0.210***	-0.273***	-0.205***	-0.273***	-0.202***	-0.227***
	(0.0320)	(0.0556)	(0.0337)	(0.0557)	(0.0342)	(0.0522)
incl. Homicide	-0.151**	-0.242***	-0.0785	-0.245***	0.0525	-0.129**
	(0.0589)	(0.0701)	(0.0532)	(0.0755)	(0.0789)	(0.0647)
incl. Accidental drowning	-0.161*	-0.163*	-0.150**	-0.212**	-0.225**	-0.192**
	(0.0824)	(0.0872)	(0.0710)	(0.0940)	(0.104)	(0.0895)
incl. Motor vehicle	-0.0432	-0.0513	-0.0203	-0.0369	-0.0793*	-0.0126
	(0.0510)	(0.0647)	(0.0494)	(0.0821)	(0.0461)	(0.0487)
incl. Suicide	-0.211***	-0.201***	-0.203***	-0.205***	-0.206***	-0.212***
	(0.0377)	(0.0593)	(0.0363)	(0.0560)	(0.0409)	(0.0678)
Genito-urinary	0.0487	-0.0682	0.0274	0.00211	0.0869	-0.0281
	(0.0737)	(0.0718)	(0.0678)	(0.0507)	(0.0664)	(0.0641)
Nervous system	0.0528	0.0553	0.0662	0.150*	0.128*	0.199**
	(0.0672)	(0.0802)	(0.0785)	(0.0761)	(0.0695)	(0.0757)
Digestive system	0.0826*	0.0604	0.0875*	0.0742	0.0693	0.0633
	(0.0464)	(0.0529)	(0.0496)	(0.0501)	(0.0550)	(0.0648)
Neoplasms	0.0322	-0.0194	0.0329	-0.0243	0.0256	-0.00745
	(0.0200)	(0.0212)	(0.0266)	(0.0157)	(0.0254)	(0.0211)

Notes: The coefficients plot the lower bound of the effect of the anti-alcohol campaign on crude death rates in high-dose regions (in percent changes) using equation (1) by cause. Data: 1978/79, 1985/86, 1988, 1989 and 1990.

Table B4. Effect of the Campaign on Maternal Mortality: Medium+High Dose vs. Low-Dose

Causes	1988	1989	1990
Maternal mortality	-0.0446	-0.176*	-0.150
	(0.100)	(0.0973)	(0.116)
1. due to abortions	-0.271**	-0.337***	-0.345**
	(0.134)	(0.120)	(0.131)
a. started in hospitals	-1.404	-0.603	0.392
	(1.489)	(1.613)	(0.640)
b. started outside hospitals	-0.253*	-0.324**	-0.373**
	(0.138)	(0.131)	(0.144)
2.due to other causes	0.164	-0.0308	0.0177
	(0.112)	(0.131)	(0.163)

Notes: The coefficients plot the lower bound of the effect of the anti-alcohol campaign on maternal mortality in medium and high-dose regions (in percent changes) using equation (1) by cause.

Appendix B

Interpretation of Estimates

When we perform the DID in equations (1) and (2), the parameter we estimate is:

$E[\Delta Y|D = h] - E[\Delta Y|D = l] = E[Y_{t=2}(h) - Y_{t=1}(0)|D = h] - E[Y_{t=2}(l) - Y_{t=1}(0)|D = l] =$
$E[Y_{t=2}(h) - Y_{t=2}(0)|D = h] + E[Y_{t=2}(0) - Y_{t=1}(0)|D = h] - E[Y_{t=2}(l) - Y_{t=2}(0)|D = l] -$
$E[Y_{t=2}(0) - Y_{t=1}(0)|D = l] = ATT(h) - ATT(l)$ under parallel trends.

In the above equation, we added and subtracted $E[Y_{t=2}(0)|D = h]$ and $E[Y_{t=2}(0)|D = l]$.

Under parallel trends, $E[Y_{t=2}(0) - Y_{t=1}(0)|D = h] - E[Y_{t=2}(0) - Y_{t=1}(0)|D = l] = 0$, so this term cancels out.
$ATT(h) = E[Y_{t=2}(h) - Y_{t=2}(0)|D = h]$ and $ATT(l) = E[Y_{t=2}(l) - Y_{t=2}(0)|D = l]$.

Thus, our DID estimator under parallel trends equals to: $ATT(h) - ATT(l)$.

Thus, if $|ATT(l)| > 0$ and the treatment effect is in the same direction as $ATT(h)$, then we are calculating an underestimate of $ATT(h)$. It is reasonable that $|ATT(l)| > 0$ because the campaign was national and the low-dose regions were treated as well.

If we want to interpret our estimate as the causal effect of going from the low dose to the high dose for the high dose group, then we need stronger assumptions than the regular parallel trends assumption. The causal effect of going from the low dose to the high dose among the regions that received the high dose can be expressed as: $E[Y_{t=2}(h) - Y_{t=2}(l)|D = h]$. We start with our estimate below (assuming already that we have parallel pre-trends):

$$\begin{aligned} &ATT(h) - ATT(l) \\ &\quad = E[Y_{t=2}(h) - Y_{t=2}(l)|D = h] + E[Y_{t=2}(l) - Y_{t=2}(0)|D = h] \\ &\quad - E[Y_{t=2}(l) - Y_{t=2}(0)|D = l] \end{aligned}$$

The selection term is: $E[Y_{t=2}(l) - Y_{t=2}(0)|D = h] - E[Y_{t=2}(l) - Y_{t=2}(0)|D = l] = ATT(l|h) - ATT(l|l)$. The selection term is zero if the treatment effect of the low dose relative to being untreated is the same for the low-dose regions and the high-dose regions. This is the strong parallel trends assumption. If the selection term is small, then the comparison we are making should be close to the causal effect of going from the low dose to the high dose for the high dose group.