Long Term Exposure to Conflict and Religious Practice: Evidence from the Strategic Bombing of Japan

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August 27, 2026

Abstract

Conflict can shape multiple behaviours and beliefs amongst those exposed to it - with one of the most important factors being their religious beliefs and behaviours. Currently there is a lack of research into the long-term impacts of conflict on religious behaviour, which our research seeks to address in the context of post-war Japan. Combining urban bombing data from the United States Strategic Bombing Survey with pre-war Japanese census data and the Japan General Social Survey we exploit variations in bombing intensity and differing exposure by birth cohorts to conduct a difference-in-difference analysis to examine the degree to which exposure to strategic bombing in the Second World War impacts later life religious practice amongst Japanese citizens. To account for issues of endogeneity in the targeting of bombing we use a novel instrument; the deviation between planned and actual square kilometres destroyed, to conduct a two-stage least squares regression. We find that increased exposure, concentrated amongst exposure in childhood and adolescence, to strategic bombing decreases later life participation in religious practice. For each additional standard deviation of damage individuals are 1.86% less likely to practice religion in later life. These results are robust to multiple definitions of bombing intensity, age exposure bands and sample specification. We also find evidence of negative effects on faith amongst those exposed in adolescence with a 1.9% decrease in faith for each additional standard deviation in damage. These findings suggest that conflict can impact both religious practice and belief in the long-term.

Keywords: Conflict, Religion, Second World War, Japan

JEL Codes: D74; Z12

1 Introduction

Conflict and war are one of the most destructive events a country can suffer from and can reshape countries and societies. The potential ways which conflict

can shape social and political attitudes are numerous with there already being literature looking at how this can manifest. A meta-analysis by Bauer et al. (2016) found a positive effect of conflict on a number of cooperative attitudes such as social and community participation as well as broader social behaviour.

Religion is another factor in people's lives which has been found to be impacted by conflict. Current evidence primarily suggests that increased exposure to conflict increases faith amongst the religious, at least in the short-term. In a study across three countries: Sierra Leone, Tajikistan and Uganda, Henrich et al. (2019) found that increased exposure to conflict increases the likelihood of participating in religious rituals amongst both Christians and Muslims. Similar positive effects of conflict on faith have been found in the context of the 2006 Lebanon War (Shai, 2022) and in Ukraine where Karakai and Moskotina (2025) found that those who were less religious before the war experienced a greater increase in religiosity following the 2022 Russian invasion. In these cases the increase in faith is primarily attributed to the role which religion can play in helping individuals process traumatic and uncertain events. However, there is also evidence of the opposite effect with regards to conflict notably Greenwald et al. (2026) who found that despite war generally increasing faith there was a limited minority whose faith declined in response to conflict in a sample of university students in Israel. This is in line with other research which has found that traumatic events can also decrease religious beliefs. For example Seirmarco et al. (2012) found that the 9/11 attacks decreased the importance of religious beliefs amongst a sub-group of individuals who lost a loved one - with this effect being associated with direct exposure to the attacks and amongst those who lost a child in the attacks. Notably there is a lack of research into the impacts of long term exposure on later life religion, with all current research being short-term. This is despite the existing literature exploring life-course changes in religion (Hayward & Krause, 2013), with qualitative research such as Ingersoll-Dayton et al. (2002) emphasising the role which adverse life events can play in loss of religiosity and research such as Bentzen (2019) looking at the impacts of other shocks such as earthquakes on religion and finding the weakening of these effects over time. Studying the determinants of religiosity, specifically religious practice, is important given what is known about its impacts on individual's lives and on society more broadly. Religious belief in itself is associated with a number of positive factors with Vanderweele (2017) noting evidence of association with life satisfaction, mental health and social relationships - with specifically participation in religious services being more important than simply spiritual beliefs. It is also an important builder of social capital, with Gemar (2025) finding that religious attendance is a strong and consistent predictor of social capital formation, while other factors such as religious beliefs are less consistent. Finally it is an important political factor with religion being found to be a predictor of both political beliefs (Scheve & Stasavage, 2006) and political participation (Driskell et al., 2008).

This paper seeks to address this lack of research by conducting an analysis on the impacts early life exposure to US strategic bombing on the religious practice and beliefs of Japanese citizens. We do this by matching cross sectional

survey data of religious attitudes in Japan to strategic bombing destruction data for bombings conducted by the United States Army Air Force (USAAF). By exploiting differing birth cohorts and levels of destruction we conduct a difference-in-difference analysis to measure the impact of higher exposure to bombing on later-life religious practice and beliefs. To account for issues with the endogeneity of bombing we use a novel instrument of deviation from planned bombing area to instrument for bombing intensity. Our results suggest that increased exposure to strategic bombing decreases religious practice in later life, with these effects being driven by exposure in childhood (0-9) and adolescence (10-19). These results are robust to a number of different specifications, including alternate measures of damage and changes to the sample. We also find that increased exposure decreases faith amongst those who either actively practice or have a family religion as well as decreasing non-religion-specific spiritual beliefs in certain exposure bands.

The first contribution of this paper is studying the long term impacts of war on later life religious practice and belief. The existing research into conflict and religion typically studies conflicts which occurred less than two decades ago (Shai, 2022) or even conflicts ongoing at the time of research (Karakai & Moskotina, 2025). This therefore does not consider how the impacts of conflict on religion could manifest in the long-term and differ from the short-term - as shown by the evidence looking at the impact of other events on religion. For example in their study of the impacts of earthquakes Bentzen (2019) find that the impacts on religion fade over time from exposure to the earthquake. Previous research has examined the long-term impacts of conflict on a number of factors such as trust Conzo and Salustri (2019), attitudes towards violence against women Doan-Pham et al. (2026) and prevalence of child labour (Churchill et al., 2022), however studying into religion remain concentrated on the short term.

Secondly, it also contributes to research on the long-term determinants of religious practice in itself. One of the closest papers to ours is Bentzen (2019) which studies the impact of exposure another external and damaging shock, earthquakes, on religious belief - finding that it increases religiosity. There has also been other research examining other long-term determinants of religion such as foreign missionary activity (Nunn, 2010), agricultural risk (Ager & Ciccone, 2018) or economic activity (Becker & Woessmann, 2013). However, there is currently no research looking at the long-term effects of historic conflicts on religious practice, despite the aforementioned short-term evidence and the evidence of weakening effects of other short term factors over time (Bentzen, 2019).

Our final contribution is methodological with our usage of a novel instrument for strategic bombing, that is the deviation from the planned target area. An inherent issue with studying strategic bombing is that it is, self evidently, strategic and targeted certain areas over others based on their underlying characteristics. Previous literature has grappled with this issue such as Adena et al. (2021) who used wind interacted with distance to to English bases to instrument for bombing in Germany during the Second World War and Miguel and Roland (2011) who used distance to the border between North and South Vietnam to

instrument for bombing intensity in the Vietnam War. In contrast rather than measuring underlying geographic characteristics we use the deviation from the planned target area to measure the overall effectiveness of the bombing which would be determined by a number of exogenous factors unknown to the planners of the USAAF including weather but also hard to quantify factors such as malfunctions, crew competence and effectiveness of air defences. The closest precedent to our instrument is Mahmood and Jetter (2023) who used variations in wind to instrument for drone strikes in Pakistan, however our instrument captures a far greater degree of exogenous variation given the far less advanced nature of bombing during the Second World War.

Japan provides an interesting and unique in which to study the impacts of conflict on religious practice and beliefs. First, Japan is a very irreligious country - where despite widely held spiritual beliefs participation and practice in organised religion is rare. Its religious landscape is also far different from the Abrahamic religious traditions in which the relationship between conflict and religion has previously been studied. Amongst those who identify as religious the most common religions are Shintoism, a set of traditional Japanese spiritual beliefs, and Buddhism. However, it is common for these two traditions to be practised simultaneously and even amongst those who identify as a member of these groups formal religious practice is rare and often isolated to rites surrounding birth and death (Reader, 1991). Secondly, the scale of the destruction wrought on Japan by the war but particular by US strategic bombing is unlike any level of man-made destruction whose impacts have been studied on religion. There is already existing literature examining other impacts of strategic bombing in Japan and besides from the numerous long term health effects such as increased suicide rates (Harada, 2024), fertility (T. Inoue & Igarashi, 2025) and the long term effects of the atomic bombings, there has also been research into the social effects such as Harada et al. (2024) who found the firebombing of Tokyo decreased socioeconomic wellbeing and neighbourhood organisation in areas more heavily impacted by bombing even decades after the war and S. Inoue et al. (2025) who found increased support for pacifist parties in postwar elections.

The next section of this paper explains the broader context of US Strategic Bombing in Japan, Section 3 presents the different types of data we use in our research, Section 4 explains the methodology of our research. Section 5 shows the results of our analysis. Section 6 concludes the paper.

2 Background

2.1 US Strategic Bombing in Japan

While there had been smaller scale raids such as the Doolittle Raid in 1942, several months after the attacks on Pearl Harbor, and Operation Matterhorn in early 1944, which performed limited raids on the Japanese home islands from India; staged through bases in China, the strategic bombing of Japan started in

earnest in November 1944 after the capture of the island of Saipan in the Pacific, which put the home islands in direct range of B-29 bombers - with bombers also flying from the nearby islands of Guam and Tinian (Craven & Cate, 1953). The intense bombing continued for nine gruelling months culminating in the atomic bombings of Hiroshima and Nagasaki and ending with the acceptance of the terms of unconditional surrender by Japan on August 15th 1945.

The Pacific Summary report from The United States Strategic Bombing Survey (USSBS) counted 806,000 causalities including 330,000 deaths (USSBS, 1947f). A large number of these bombings were conducted using incendiary bombs which devastated the mostly wooden homes of Japan. The vast majority of the 168,800 bombs dropped on the Japanese home islands, 147,000 tonnes, were dropped by the B-29 Superfortress aircraft of the USAAF (USSBS, 1947f).

2.2 Evacuations

An important factor which could impact the validity of our analysis is the fact that a number of cities in Japan were subject to civilian evacuations due to the bombing campaigns. These evacuations were both preemptive and as a reaction to bombing[1]. While it is not possible to determine the rates of ad hoc evacuations we can select those areas that were subject to official evacuation orders. Evacuations focused on children with the government issuing evacuation orders for school children from the following cities: Tokyo, Osaka, Yokohama, Kawasaki, Yokosuka, Nagoya, Kobe, Amagasaki, Moji, Kokura, Tobata, Wakamatsu, Hiroshima, Kure, Kyoto and Maizuru. These cities are spread across 8 of the 46 prefectures we will be analysing [2]. They also include the sites of the two most devastating bombings of the campaign: the March 1945 firebombing of Tokyo and the August 1945 Atomic bombing of Hiroshima. Postwar reports show high compliance with evacuation orders with 90% of children in the 12 largest cities subject to these orders evacuating (USSBS, 1947c). In addition to these areas, despite it not being subject to an official evacuation order, there is evidence of ad-hoc evacuations of students from Nagasaki city with the USSBS report finding a 65% drop in enrolment between 1st and 6th grades preceding the atomic bombing with one third of these students estimated to have been evacuated outside of the prefecture (USSBS, 1947d). We therefore also exclude Nagasaki prefecture from our analysis. Given that our identification strategy involves an assumed early life exposure to bombing we exclude these nine prefectures in order to best ensure that those in our sample were indeed exposed to bombing in early life. A consequence of this is that our baseline analysis excludes the three most heavily bombed areas: Tokyo, Hiroshima and Nagasaki - however we also examine the robustness of our results to the inclusion of these

[1] For example the USSBS found evacuees had similar rates of exposure to bombing as those who remained in urban areas (59% vs 60%) and higher rates of exposure to air raids more broadly (90% vs 76%) and noted that personal experience with an air raid frequently was a cause of evacuation in itself (USSBS, 1947b).

[2] These prefectures are: Tokyo, Kanagawa, Aichi, Kyoto, Osaka, Hyogo, Hiroshima and Fukuoka

evacuated prefectures.

3 Data

Our primary data source is the Japanese General Social Survey (JGSS) conducted by the Osaka University of Commerce. It is based on the conducted General Social Survey conducted in the United States. The survey is a repeated cross-section which has conducted thirteen surveys since its beginning in 2000. It draws its samples from individuals in large cities, small cities and towns across six blocks of Japan - ensuring coverage of all prefectures in our research. Our research uses the first 12 of these waves which covers the years 2000, 2001, 2002, 2003, 2005, 2006, 2008, 2010, 2012, 2015, 2016, 2017 and 2018. The survey includes those between the ages of 20 and 89. This survey contains a number of important variables for our analysis: most importantly including religious practice, which is a three point question on whether someone practices religion which has the options of "Yes", "Although I do not believe in personally, I have a family religion" and "No". For our analysis we create a binary equal to 1 if they answer "Yes" and equal to 0 for the remaining options. It also includes religious affiliation amongst those who either practice or have a family religion and faith in their religion amongst that same group. It also includes important demographic controls such as age, gender and marital status. For geographic matching the survey contains questions on one's current prefecture and the size of the municipality they live in as well as the same variables at age 15[3]. We restrict our sample to those living in the same prefecture they did at age 15.

In order to measure the long-term effects of US strategic bombing we combine a number of different data sources: Our bombing data is sourced from the records of the USSBS and contains city-level data of the deaths, injuries, buildings destroyed, tonnage and types of bombs used across 66 cities (USSBS, 1947a). This data by tonnage accounts for 93.2% of all bombs dropped by B-29s during urban area operations in Japan[4] as well as 82.6% of the total tonnage of bombing dropped by B-29s on the home islands. This data is broadly consistent with other postwar estimates such as the Japanese cabinet estimates used by (Harada, 2024) with the exception of under-estimating deaths and buildings destroyed in Hiroshima and Nagasaki likely due to both the delayed deaths and the difficulty of assessing deaths and damage caused by the atomic bombings. Finally, to measure pre-war population and households we use the 1940 Japanese

[3]To address potential concerns about those in the sample moving to their location after the war we looked at post-war internal migration and found that a majority of it was directed towards Japan's major cities of Tokyo, Osaka and Kobe which are already excluded from our baseline due to their evacuations. Our evacuated prefectures received 58.59% of postwar internal migration between 1954 and 1960 which we hope can assuage concerns about migration impacting our identification.

[4]This percentage was obtained by cross-referencing our city-level data with bombing tonnage data from the Theatre History of Operations Reports (THOR) dataset amongst bombing operations classified as urban area operations as opposed to operations targeting specific factories or military installations which are unlikely to have impacted our civilian sample

census which contains data on the populations and number of households in all contemporary cities of Japan (National Statistics Center, 1940). We then aggregate both our bombing and census data to the sub-prefectural level: giving totals for the urban area for each prefecture[5] Restricting to those living in the same prefecture as they did at age 15 our combined survey waves have a sample size of 26,048. Removing those from prefectures subject to evacuations leaves us with 18,485 - with 6240, roughly 34%, being born between 1911 and 1945 - which places them in the birth cohort for exposure to bombing.

3.1 Descriptive Statistics

This section will summarise the distribution of our variables at both the individual and prefectural level. Table 1 displays descriptive statistics for our sample - comparing those in our exposed group, those between the ages of 0 and 35 in 1945 and our unexposed sample. There is no significant difference in age between the exposed and unexposed groups. Unsurprisingly, those exposed to strategic bombing during the Second World War are significantly older than those unexposed - which likely also explains the higher rates of religious practice and marriage - both factors known to be positively correlated with age. In our model we account for these differences through the usage of both birth-year fixed effects as well as age bands at time of survey.

Table 1: Descriptive Statistics by Exposure Status

	All	Unexposed	Exposed	Difference
Individual				
Female	1.534	1.530	1.542	-0.012
	(0.499)	(0.499)	(0.498)	[-1.533]
Age (Years)	52.444	43.144	70.694	-27.550***
	(16.914)	(12.123)	(7.505)	[-189.979]
Practices Religion	0.102	0.078	0.152	-0.073***
	(0.303)	(0.268)	(0.359)	[-13.704]
Marital Status	0.711	0.697	0.740	-0.043***
	(0.453)	(0.460)	(0.439)	[-6.207]
Area				
Percentage of Urban Areas Destroyed	0.045	0.052	0.030	0.022***
	(0.100)	(0.106)	(0.087)	[15.130]
Percentage of Planned Area (M^2) Destroyed	0.183	0.214	0.121	0.093***
	(0.359)	(0.377)	(0.310)	[17.949]
N	18485	12245	6240	

*** p<0.01, ** p<0.05, * p<0.1

[5]We classify urbanity in both cases based on which cities are classified as cities (*shi*, 市) in the 1940 census

Next in Table 2 we also look at descriptive for faith and religious affiliation amongst those who identify as either practising religion or having a family religion. We find that those exposed to bombing have significantly higher faith if religious but lower likelihood of consulting fortunetellers or choosing auspicious dates. Amongst those who are religious or have a family religion they are significant more likely to be Buddhist and less likely to be Christian or Soka Gakkai[6].

Table 2: Descriptive Statistics for Religion

	All	Unexposed	Exposed	Difference
Religious Variables				
Faith in Religion	1.429	1.327	1.547	-0.220***
	(0.624)	(0.582)	(0.650)	[-13.573]
Fortuneteller for Child Name	0.514	0.610	0.349	0.261***
	(0.500)	(0.488)	(0.478)	[7.358]
Belief in Life After Death	0.181	0.213	0.134	0.079***
	(0.385)	(0.410)	(0.341)	[6.427]
Auspicious Dates	0.957	0.956	0.961	-0.005
	(0.202)	(0.206)	(0.194)	[-0.380]
Religious Denominations				
Shinto	0.035	0.037	0.033	0.004
	(0.184)	(0.189)	(0.179)	[0.795]
Buddhist	0.753	0.738	0.771	-0.033***
	(0.431)	(0.440)	(0.421)	[-2.934]
Christian	0.017	0.022	0.010	0.012***
	(0.129)	(0.148)	(0.100)	[3.798]
New Religions	0.003	0.003	0.003	0.000
	(0.056)	(0.058)	(0.054)	[0.288]
Soka Gakkai	0.050	0.065	0.031	0.034***
	(0.218)	(0.247)	(0.174)	[6.260]
Observations	5881	3161	2720	

*** p<0.01, ** p<0.05, * p<0.1

We now turn to examining the geographic variation in bombing. Figure 3.1 shows the ratio of urban housing destruction across Japan's home islands, sourced from the USSBS and 1940 Japanese census and Religious Practice sourced from our JGSS data. As can be seen there is significant variation across Japan with the most destruction occurring in Ibaraki, Fukui and Yamanashi prefectures. Meanwhile there is also large variation in religious practice with levels as low as 5% in Fukushima prefecture to as high 20.7% in Fukui prefecture.

[6]Soka Gakkai is a Buddhist-based New Religion. In our analysis we treat it as separate from other New Religions due to its disproportionately large following in our sample

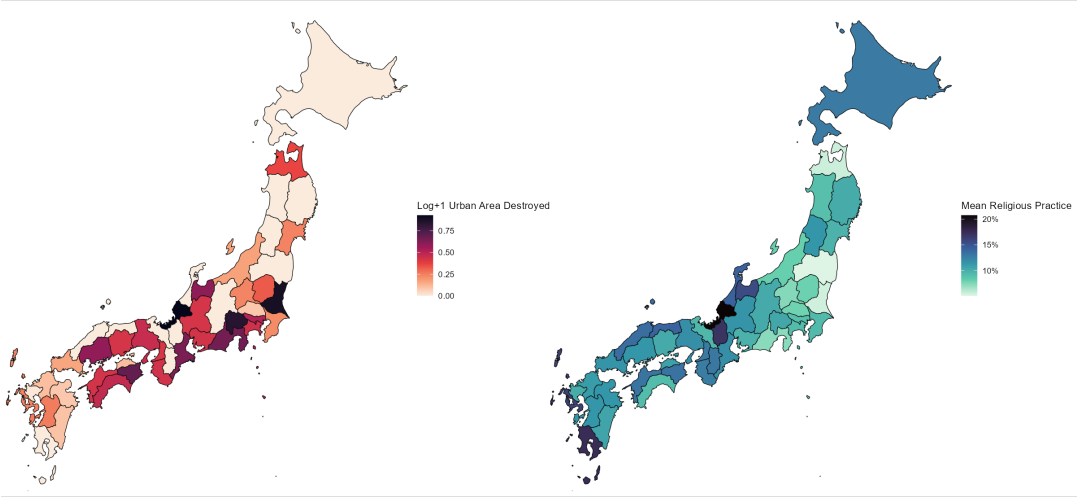


Figure 1: Percentage of Urban Areas Destroyed by Prefecture (1944-1945) and Percentage of Prefecture Practising Religion (2000-2018)

Our Appendix we include an additional figure showing our alternate damage measures, Figure A1. Comparing the geographic distribution of these other measures we find similar wide distributions of de-housing and bomb tonnage. We find far higher ratios of death in Hiroshima and Nagasaki which is unsurprising considering the uniquely destructive nature of the atomic bombings.

4 Methodology

Using our data on bombing intensity and exploiting variations in birth date in our sample we construct the following model:

$$Y_{ipt} = \beta lnD_p * C + T + R + X_i + \varepsilon_{ipt} \tag{1.1}$$

The variable Y represents our various outcome variables. Our coefficient of interest is β which shows the impact of the interaction of D and C on our outcome. D is our ratio of damage or fatalities at the sub-prefecture level. The American bombing campaign was focused on urban areas so we aggregate together our damage data for all urban areas per prefecture and match it to those residing in urban areas at age 15, while leaving those in rural areas as having zero bombing exposure. C is a binary variable which takes a value of 1 if someone's birth date falls into our exposed range and 0 if they do not.

Our model also includes fixed effects for prefecture interacted with municipal classification at age 15 and current municipal classification, represented by R and fixed effects for year of birth, represented by T. By including these fixed effects we are able to isolate the within area effects of exposure to bombing by birth cohort. We first run on a single cohort for all individuals exposed to bombing which ranges from 0-35. We then break it into three cohorts: 0-9 years old, 10-19 years old and 20-35. Our first two cohorts are based off those used by the World Health Organisation for childhood and adolescence respectively(Singh et al., 2019). The final bands collates all adult exposure - with the number of individuals aged 30+ in 1945 in our sample being very small. In addition we test alternate cohort windows in our robustness section. We also include X which is a vector of controls which consist of age bands, sex, survey year and marital status. Our model therefore is a difference-in-difference model and comes with the implicit assumption of parallel trends between those exposed and unexposed to the bombings, something aided by the inclusion of both area and birth year fixed effects. Finally, ε represents the error term.

4.1 Instrumental Variable Analysis

One issue with looking at the impact of US strategic bombing is that it was not random - targets were well documented and specifically chosen for strategic purposes. This could impact our results and our findings could therefore be impacted by unobservable factors which can't be fully accounted for by the usage of fixed effects. To address this issue we undertake a two-stage least squares (2SLS) analysis using an instrumental variable to predict plausibly exogenous variations in bombing intensity. For this purpose we turn again to the United States Strategic Bombing Survey which contains both planned and actual square kilometres of destruction by city (USSBS, 1947e), which we then calculate the difference between. We choose this instrument for two main reasons. Firstly, as it measures deviation from a planned area of bombing it is very likely to be directly correlated to bombing intensity. Secondly, this deviation would capture a number of exogenous factors which would only impact our outcomes through its relation to bombing intensity. While factors such as malfunctions of equipment, psychological stress of pilots and competence of air defence were noted at the time to have been important to the success of missions (Kissner, 1945) the most noticeable factor are variations in weather. While US planners and pilots were aware of the general weather conditions in each city, unexpected weather phenomena would interfere with plans and force crews to rely on ground scanning radar rather than visual confirmation of targets. Craven and Cate (1953) note an illustrative example from the August 8th 1945 mission targeting Yawata:

"*Eleven groups drawn from three wings were dispatched, carrying a mixed load of incendiaries. Although visual conditions had been forecast, the crews found heavy clouds over Yawata; smoke from fires started by the first-comers further obscured the target and 136 of the 221 planes bombing did so by radar. Results were considered only fair: 1.22 square miles were burned out, 21 per*

cent of the urban area and 33 per cent of the planned target area."

However, unpredictable fluctuations in weather can also increase the destruction of a firebombing with ground-level wind being cited as an important factor in the effectiveness of the March firebombing of Tokyo (Kissner, 1945). We construct our instrument by dividing the actual destroyed area,in square miles, by the planned square mileage to create a ratio of how much the bombing of each city deviated from its planned area, then aggregate it across all targeted cities in a prefecture.

$$TR = \sum_{p \in \mathcal{P}} \frac{PlannedTargetArea}{AreaDestroyed} \tag{1.2}$$

The ratio varies widely from 33.3% of the targeted urban area destroyed in Kumamoto prefecture to destruction greatly exceeding the planned area in Shizuoka - destroying 123.4% of the planned square miles. We show the geographic distribution in Figure A2 in our Appendix.

Now that we have explained our instrument we will explain how we use it as part of a 2SLS model.

$$\widehat{lnD_p} * C = TR_p * C + T + R + X_i + \epsilon_{icy} \tag{1.3}$$

$$Y_{ipt} = \beta \widehat{lnD_p} * C + T + R + X_i + \varepsilon_{icy} \tag{1.4}$$

In essence our 2SLS model is a modification of our first model. We use the ratio of the targeted urban area destroyed in each prefecture to predict the ratio of destruction in overall urban areas is each prefecture. In the cases of prefectures without planned areas of destruction we set the instrument equal to zero.

5 Results

5.1 Baseline Analysis

We first present our OLS results from Equation 1.1 in Table 3. Our results find that increased exposure to bombing decreases one's odds of participating in religion. Specifically we find for each additional standard deviation of damage individuals are exposed to individuals in our sample are 1.6% less likely to practice religion in later life[7]. Breaking it down by age bands we find that this seems to primarily driven by exposure in later childhood to early teens, with stronger results amongst those between the ages of 10 and 19, with each additional

[7]We calculate this by multiplying the coefficient by the standard deviation of the damage treatment

Table 3: Baseline Analysis

	Overall		Age Sub-bands	
	(1)	(2)	(3)	(4)
	No Controls	Controls	No Controls	Controls
Damage × Exposure (all ages)	-0.180***	-0.185***		
	(0.063)	(0.063)		
Damage × Exposure (ages 0–9)			-0.156**	-0.161**
			(0.065)	(0.064)
Damage × Exposure (ages 10–19)			-0.243**	-0.246**
			(0.096)	(0.097)
Damage × Exposure (ages 20–35)			-0.117	-0.128
			(0.169)	(0.170)
Controls	No	Yes	No	Yes
Observations	17,409	17,409	17,409	17,409
Mean of outcome	0.102	0.102	0.102	0.102

Notes: Results from Equation 1.1. Outcome is a binary variable taking a value of 0 if respondent does not practice religion at all or if they don't practice but have a family religion and a value of 1 if respondent practices religion. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

We next present our instrumental variable analysis for both our overall exposure group and bands of exposure in Table 4. We find that across both it produces results broadly similar to our OLS results once again suggesting a negative impact of increased exposure to bombing on the practice of religion. In this case we find that each additional SD of damage individuals are exposed to makes them 1.86% less likely to practice religion in later life, with similar stronger results seen in the 10-19 age band. The concentration of these effects around exposure in younger life aligns with Bai and Wu (2020) and their study of the impacts of the Cultural Revolution in China who found significant effects of this violent event on trust - but only amongst those exposed between the ages of 8 and 22. Our instrument also satisfies the Kleinbergen-Paap threshold in both the overall and sub-band analysis.

Table 4: Instrumental Variable Analysis

	(1) Overall	(2) Age Sub-bands
Panel A: Second stage		
Damage × Exposure (all ages)	-0.214**	
	(0.091)	
Damage × Exposure (ages 0–9)		-0.222**
		(0.095)
Damage × Exposure (ages 10–19)		-0.243**
		(0.120)
Damage × Exposure (ages 20–35)		-0.077
		(0.230)
Panel B: First stage		
Planned × Exposure (all ages)	0.221***	
	(0.037)	
Planned × Exposure (ages 0–9)		0.221***
		(0.036)
Planned × Exposure (ages 10–19)		0.220***
		(0.038)
Planned × Exposure (ages 20–35)		0.237***
		(0.047)
Controls	Yes	Yes
Observations	17,409	17,409
Mean of outcome	0.102	0.102
KP F-statistic	36.25	10.09

Notes: Results from Equation 1.4. Second stage outcome is a binary variable taking a value of 0 if respondent does not practice religion at all or if they don't practice but have a family religion and a value of 1 if respondent practices religion. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

5.2 Robustness Analysis

5.2.1 Sub-Sample and Alternate Sample Analysis

We will now explore the sensitivity of our results to changes in the sample. This will help us to understand how our effects vary between groups. We present these results in Figure 5.2.1 and in Table A1 and Table A2 in our Appendix.

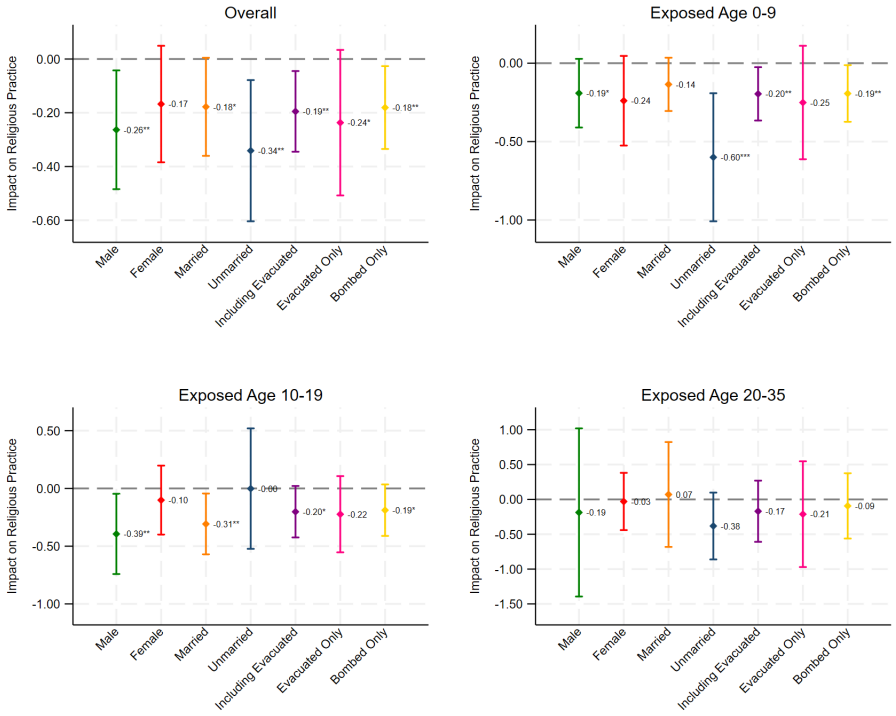


Figure 2: Heterogeneity of exposure to strategic bombing on later-life religious practice

First we break down our results by demographic factors to determine how our effects differ. Dividing results by sex we find a stronger negative effect amongst men than our baseline and non-significant effects amongst women, which implies that men are more strongly impacted by conflict than men.We then break it down by marital status and find far stronger results amongst unmarried individuals. This stronger result could be due to a number of factors such as being unmarried and non-religious both being rejection of traditionalist norms as was posited by Doan-Pham et al. (2026) in their study of the Vietnam War. We then explore changes to the underlying sample. Our base specification excludes 9 prefectures that were subject to evacuations of school children in order to better ensure exposure to bombing. However, indirect exposure to bombing and being exposed to the destruction caused by bombing could still potentially impact later life beliefs. We therefore both expand our sample to include the evacuated prefectures and then restrict it to only include these prefectures. We find that including the evacuated prefectures still produces significant results. We find negative This supports the idea that our findings are driven by direct exposure during the war rather than indirect exposure after

the fact. Additionally, we exclude prefectures which received no bombing[8] so our model only compares differences in intensity between prefectures which suffered bombing. We find the results are weaker but still significant and similar to our baseline.

5.2.2 Alternate Religious and Spiritual Outcomes

We now examine the degree to which exposure to strategic bombing can impact other religious and spiritual variables besides from whether someone actively practices religion. This will allow us to understand whether changes in religious practice are driven by changes in underlying beliefs or by other factors. We present these results in Figure 5.2.2 with the full results in our Appendix in Table A4. We first look at faith amongst those who practice religion and amongst those who have a family religion. We find that increased exposure to strategic bombing decreases faith amongst those who were exposed between the ages of 10 and 19, with each additional standard deviation decreasing faith in religion by 1.90% on the three point scale of faith. We then look at three different measures of general spiritual beliefs: that being whether someone consults a fortune teller when naming their child, whether someone believes in life after death and whether someone chooses auspicious days for special occasions. In these cases we do not find significant results for the overall sample but we find evidence of negative sub-band effects for using a fortune teller to name ones child and choosing auspicious days for special occasions.

[8]These prefectures are: Hokkadio, Iwate, Akita, Yamagata, Fukushima, Ishikawa, Nagano, Shiga, Nara, Tottori, Shimane and Kagoshimo. Additionally, Kyoto received no bombing but is already excluded as it was evacuated.

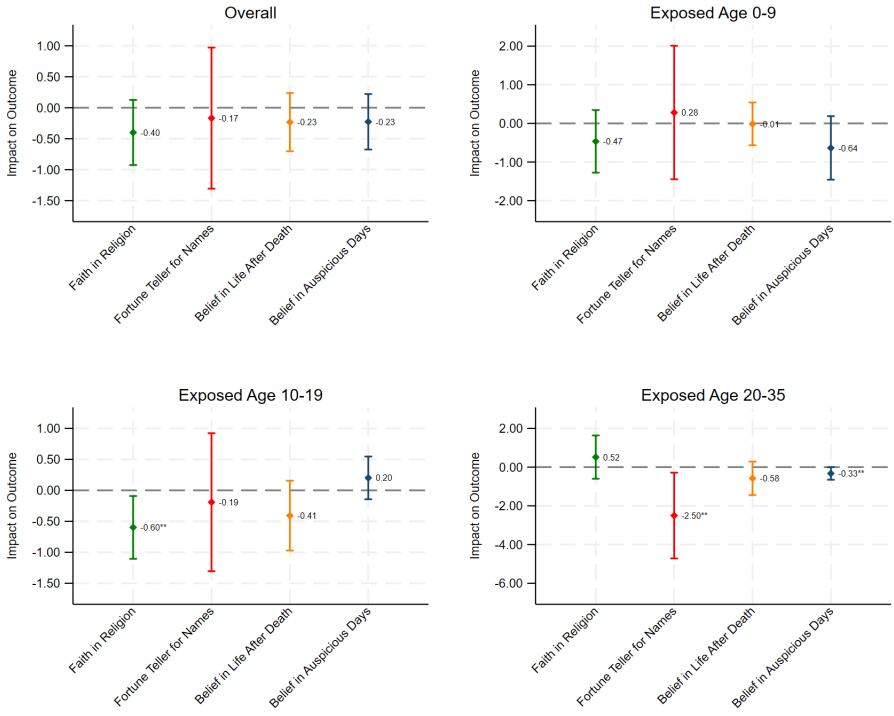


Figure 3: Impact of exposure to strategic bombing on later-life spiritual beliefs

Additionally, we look at whether there is an impact on types of religious affiliation amongst both those who practice and those who have family religions. For this we group religions into five broad religious groups: Shinto (including Sect Shinto and Shinto New Religious Movements) , Buddhist (Including Buddhist New Religious Movements) , Christianity, other New Religious Movements (such as the Unification Church) and finally we include the Buddhist-influenced New Religious movement Soka Gakkai as its own group given its large presence amongst the religious in our sample. These results are presented in Table A5 in our Appendix. We find that amongst those who are religious, in certain age sub samples, exposure to bombing makes individuals more likely to be Buddhist and less likely to be Christian or in a New Religion.

5.2.3 Alternate Age Exposure Bands

In our initial analysis we use three age bands of 0-9, 10-19 and 20-35. However, it is important to test alternate exposure bands to better understand which ages ranges are most affected by bombing. These results are presented in Table A3 in our Appendix. We first use a broader definition of adolescence ranging from

8-22, with the younger and older ages binned into two more bands: 0-7 and 23-35. This broader definition follows Bai and Wu (2020) and yields significant and negative results for both 0-7 and 8-22. We then use broader bands splitting the sample into above and below 18 years old, which yields negative results for the 0-18 age band. We finally use narrower age bands of 0-5, 6-10, 11-15, 16-20 and 21-35. In this case we find negative and significant effects for the 6-10 and 11-15 bands - with the results stronger and more significant for the former.

5.2.4 Alternate Measures of Damage

In our initial specification we use the ratio of destroyed buildings amongst an urban area's pre-war number of households. However, we also have a number of alternate measures of strategic bombing damage: specifically deaths and de-housing from bombing and bomb tonnage. Although these factors would be correlated they have the potential to impact beliefs in different ways. We show these results in our Appendix Table A6. First we divide deaths by the pre-war urban population. Secondly, we use the number of "de-housed" individuals, that is individuals who had their houses destroyed, divided by the pre-war urban population. Finally we replace our damage treatment with the tonnage of bombs divided by pre-war population. All three of these alternate treatments display similar results to our baseline treatment. Exposure to an additional standard deviation of fatalities makes individuals 1.67% less likely to practice religion in later life. Meanwhile, exposure to an additional standard deviation of de-housing decreases it by 1.75%. Finally, exposure to an additional standard deviation of bomb tonnage per household reduces later-life religious practice by 1.69%.

5.2.5 Placebo Tests

Next we perform a number of placebo tests. This involves re-running our baseline specification with similar age bands at different times post-war - replacing age in 1945 with other years in the decades post-war. This will ensure that the impacts we are seeing are caused by bombing itself rather than potential post-war correlates of bombing. These results are presented in Table A7 and show insignificant effects for placebos covering the four decades post-war. This confirms our assumption that the effects we find are through direct exposure to the bombing, rather than post-war exposure.

6 Discussion

This research examines the long-term impacts of strategic bombing on religious practice in Japan. Our results show that additional exposure to strategic bombing decreases later-life practice of religion - with each additional standard deviation of bombing damage one is exposed to decreasing their likelihood of practising religion by 1.86%. Additionally we find that increased exposure to bombing decreases faith in religion amongst those who either practice or have a family religion in certain sub-samples. These findings of decreased religious

practice contrast with a majority of the literature on the shorter-terms effects of conflict and religion such as Shai (2022) and Karakai and Moskotina (2025) who found an increase in faith as a result of conflict. However, a negative impact of traumatic events on religiosity has been found in some cases such as Seirmarco et al. (2012) and their study of relatives of those who died on 9/11. It is also important to consider the Japanese-specific factors at play such as the strong linkage between the militaristic Japanese state and religion, primarily Shinto but also a number of Buddhist groups, before and during the Second World War (Hardacre, 1989). Wartime destruction, which could be attributed as a result of this spiritually-linked militarism, could therefore turn those exposed to it away from organised religious practice. The closest analogue to this kind of institutional failure would be the decline in Catholic religious practice found by Bottan and Perez-Truglia (2015) as a result of clergy abuse scandals.

The implications of our findings are important for both understanding the determinants of religion and the impacts of conflict. Our findings show that exposure to traumatic events such as conflict need not necessarily result in a religious revival and in our case can erode religious practice in the long-term. Additionally, it shows that besides from its previously studied impacts on other aspects of society such as trust (Conzo & Salustri, 2019) and political beliefs (S. Inoue et al., 2025), conflict can in the long-term also decrease the religious practice of a society which in itself represents a large change but also has further impacts for factors associated with religious practice such as its positive association with factors such as health and its association with differences in political beliefs (Scheve & Stasavage, 2006) and participation (Driskell et al., 2008).

Our study examines the long-term impact of conflict on religious practice in the context of Japan in the Second World War. However, Japan has a very unique religious landscape . Therefore, it would be useful to study the long-term effects of conflict on religion in other parts of the world such as in the other belligerents of the Second World War and in other past conflicts such as Korean War and Vietnam War.

7 Conclusion

In this study we examine the long-term impacts of exposure to strategic bombing on later life religious beliefs. We do this by exploiting differences in the intensity of US strategic bombing and exposure by age cohorts utilising data from the Japan General Social Survey, the United States Strategic Bombing Survey and the Japanese Census and using a two-stage least squares model to account for the endogeneity of bombing. We find long-term decreases on religious practice amongst those who are exposed to additional bombing. These results are robust to alternate measures of strategic bombing damage and alternate sample structures.

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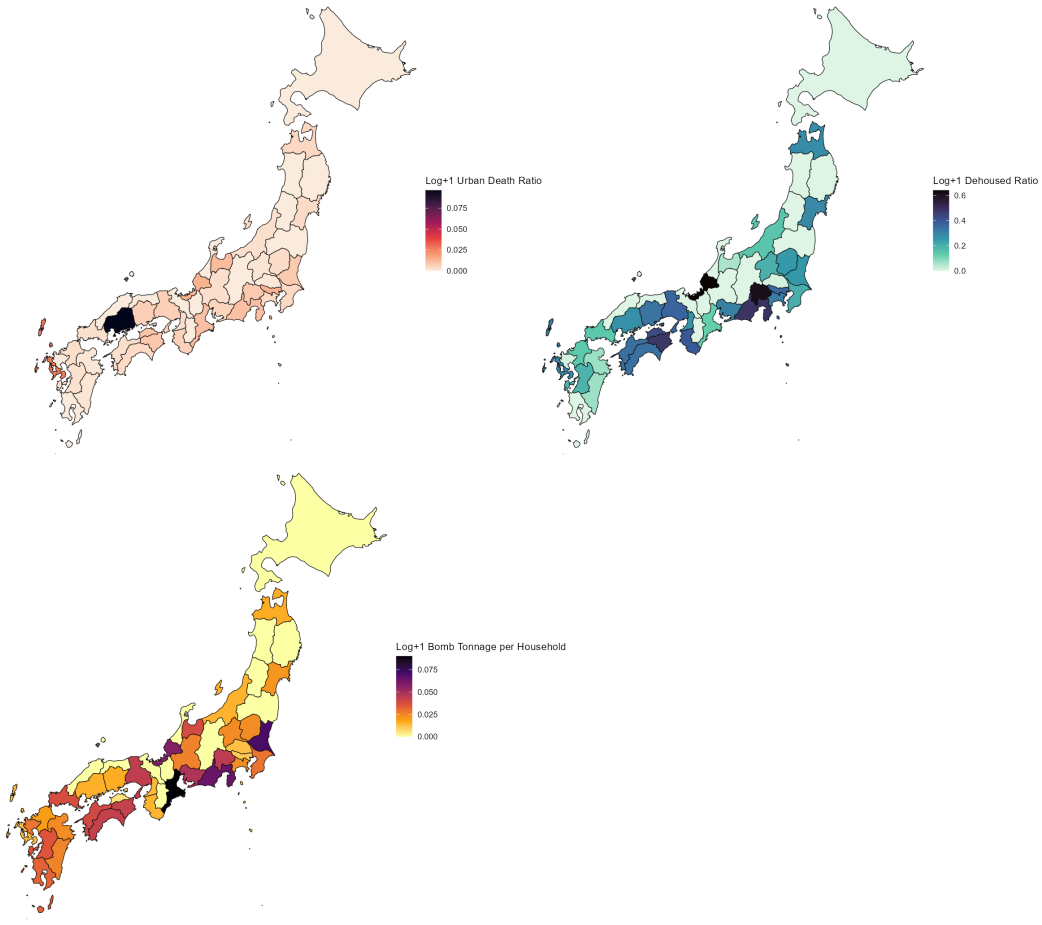


Figure A1: Percentage of Pre-War Urban Population Killed and De-Housed and Bomb Tonnage per Household by Prefecture (1944-1945)

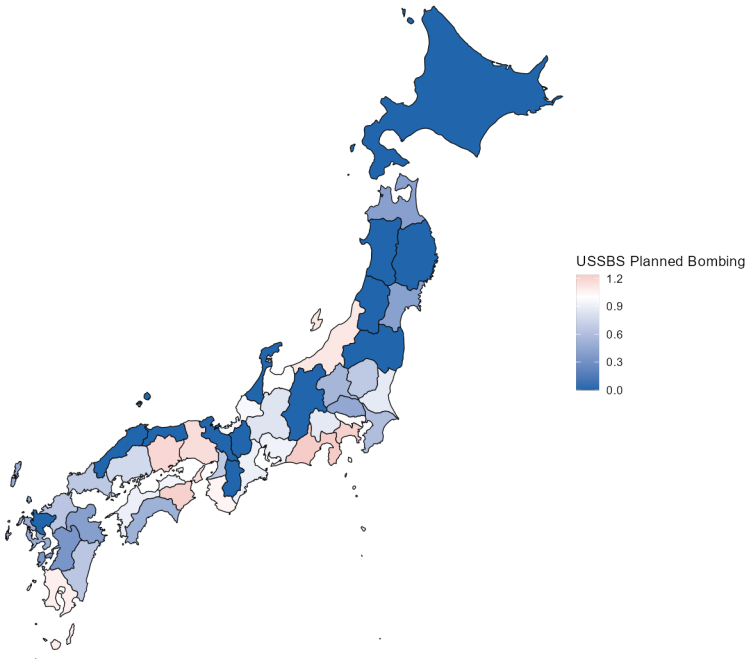


Figure A2: Ratio of Planned Square Kilometres of Urban Area Destroyed by Prefecture (1944-1945)

Table A1: 2SLS: Heterogeneity Analysis

	Male		Female		Married		Unmarried	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands	(7) Overall	(8) Sub-bands
Panel A: Second stage								
Damage × Exposure (all ages)	-0.263**		-0.168		-0.178*		-0.341**	
	(0.113)		(0.111)		(0.093)		(0.134)	
Damage × Exposure (ages 0–9)		-0.191*		-0.240		-0.135		-0.600***
		(0.112)		(0.146)		(0.087)		(0.208)
Damage × Exposure (ages 10–19)		-0.394**		-0.101		-0.308**		-0.002
		(0.177)		(0.152)		(0.134)		(0.266)
Damage × Exposure (ages 20–35)		-0.188		-0.030		0.071		-0.382
		(0.616)		(0.210)		(0.384)		(0.245)
Panel B: First stage								
Planned × Exposure (all ages)	0.224***		0.218***		0.221***		0.224***	
	(0.038)		(0.035)		(0.037)		(0.039)	
Planned × Exposure (ages 0–9)		0.221***		0.221***		0.222***		0.214***
		(0.038)		(0.035)		(0.036)		(0.042)
Planned × Exposure (ages 10–19)		0.242***		0.197***		0.218***		0.228***
		(0.043)		(0.034)		(0.040)		(0.043)
Planned × Exposure (ages 20–35)		0.176***		0.269***		0.220***		0.252***
		(0.031)		(0.054)		(0.051)		(0.044)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,146	8,146	9,263	9,263	12,361	12,361	5,046	5,046
Mean of outcome	0.101	0.101	0.103	0.103	0.103	0.103	0.101	0.101
KP F-statistic	34.21	11.48	38.34	11.87	35.69	5.50	35.34	9.01

Notes: Results from a modified form of Equation 1.4. Second stage outcome is a binary variable taking a value of 0 if respondent does not practice religion at all or if they don't practice but have a family religion and a value of 1 if respondent practices religion. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A2: 2SLS: Alternate Sample Specifications

	Including Evacuated Prefectures		Evacuated Prefectures Only		Excluding Unbombed	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands
Panel A: Second stage						
Damage × Exposure (all ages)	-0.195**		-0.237*		-0.181**	
	(0.077)		(0.138)		(0.079)	
Damage × Exposure (ages 0–9)		-0.195**		-0.251		-0.194**
		(0.087)		(0.185)		(0.092)
Damage × Exposure (ages 10–19)		-0.202*		-0.223		-0.188*
		(0.114)		(0.168)		(0.114)
Damage × Exposure (ages 20–35)		-0.170		-0.212		-0.093
		(0.224)		(0.387)		(0.239)
Panel B: First stage						
Planned × Exposure (all ages)	0.174***		0.145***		0.175***	
	(0.024)		(0.031)		(0.024)	
Planned × Exposure (ages 0–9)		0.174***		0.144***		0.174***
		(0.023)		(0.031)		(0.024)
Planned × Exposure (ages 10–19)		0.171***		0.143***		0.173***
		(0.024)		(0.030)		(0.025)
Planned × Exposure (ages 20–35)		0.193***		0.168***		0.196***
		(0.025)		(0.033)		(0.026)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,048	26,048	8,637	8,637	20,185	20,185
Mean of outcome	0.105	0.105	0.110	0.110	0.101	0.101
KP F-statistic	54.57	17.96	21.48	7.13	50.94	16.95

Notes: Results from a modified form of Equation 1.4. Second stage outcome is a binary variable taking a value of 0 if respondent does not practice religion at all or if they don't practice but have a family religion and a value of 1 if respondent practices religion. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A3: 2SLS: Alternate Age Bands

	(1) 0–7 / 8–22 / 23–35	(2) 0–18 / 19–35	(3) 0–5 / 6–10 / 11–15 / 16–20 / 21–35
Panel A: Second stage			
Damage × Exposure (Band 1)	-0.227**	-0.235***	-0.168
	(0.109)	(0.083)	(0.118)
Damage × Exposure (Band 2)	-0.208**	-0.064	-0.297***
	(0.102)	(0.228)	(0.106)
Damage × Exposure (Band 3)	-0.148		-0.284*
	(0.413)		(0.172)
Damage × Exposure (Band 4)			-0.113
			(0.186)
Damage × Exposure (Band 5)			-0.132
			(0.241)
Panel B: First stage			
Damage × Exposure (Band 1)	0.216***	0.221***	0.222***
	(0.036)	(0.037)	(0.038)
Damage × Exposure (Band 2)	0.227***	0.231***	0.223***
	(0.039)	(0.043)	(0.037)
Damage × Exposure (Band 3)	0.234***		0.217***
	(0.049)		(0.040)
Damage × Exposure (Band 4)			0.218***
			(0.037)
Damage × Exposure (Band 5)			0.238***
			(0.052)
Controls	Yes	Yes	Yes
Observations	17,409	17,409	17,409
Mean of outcome	0.102	0.102	0.102
KP F-statistic	10.46	18.26	4.85

Notes: Results from a modified form of Equation 1.4. Second stage outcome is a binary variable taking a value of 0 if respondent does not practice religion at all or if they don't practice but have a family religion and a value of 1 if respondent practices religion. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A4: Alternate Measures of Religion

	Faith		Fortune (Child Name)		Life After Death		Auspicious Day	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands	(7) Overall	(8) Sub-bands
Panel A: Second stage								
Damage × Exposure (all ages)	-0.400		-0.168		-0.233		-0.227	
	(0.268)		(0.581)		(0.240)		(0.228)	
Damage × Exposure (ages 0–9)		-0.466		0.281		-0.013		-0.635
		(0.413)		(0.881)		(0.282)		(0.419)
Damage × Exposure (ages 10–19)		-0.598**		-0.191		-0.408		0.201
		(0.259)		(0.568)		(0.288)		(0.176)
Damage × Exposure (ages 20–35)		0.517		-2.503**		-0.579		-0.327**
		(0.570)		(1.130)		(0.442)		(0.165)
Panel B: First stage								
Planned × Exposure (all ages)	0.215***		0.231***		0.221***		0.216***	
	(0.035)		(0.041)		(0.038)		(0.036)	
Planned × Exposure (ages 0–9)		0.221***		0.199***		0.223***		0.192***
		(0.036)		(0.031)		(0.043)		(0.029)
Planned × Exposure (ages 10–19)		0.210***		0.264***		0.219***		0.255***
		(0.038)		(0.058)		(0.036)		(0.057)
Planned × Exposure (ages 20–35)		0.217***		0.218***		0.234***		0.228***
		(0.038)		(0.054)		(0.041)		(0.058)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,880	5,880	786	786	3,762	3,762	1,029	1,029
Mean of outcome	1.430	1.430	0.515	0.515	0.181	0.181	0.957	0.957
KP F-statistic	37.86	10.12	32.12	5.37	33.93	9.11	36.83	5.22

Notes: Results from a modified form of Equation 1.4. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A5: 2SLS: Alternate Religious Variables

	Outcome 1		Outcome 2		Outcome 3		Outcome 4		Outcome 5	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands	(7) Overall	(8) Sub-bands	(9) Overall	(10) Sub-bands
Panel A: Second stage										
Damage × Exposure (all ages)	0.046		0.134		-0.038		-0.011		-0.146	
	(0.059)		(0.134)		(0.037)		(0.023)		(0.131)	
Damage × Exposure (ages 0–9)		-0.034		0.341**		-0.026		-0.015		-0.117
		(0.094)		(0.162)		(0.044)		(0.025)		(0.153)
Damage × Exposure (ages 10–19)		0.088		-0.006		-0.079*		-0.003		-0.197
		(0.102)		(0.272)		(0.046)		(0.047)		(0.123)
Damage × Exposure (ages 20–35)		0.298		-0.427		0.028		-0.021*		-0.134
		(0.238)		(0.393)		(0.125)		(0.013)		(0.162)
Panel B: First stage										
Planned × Exposure (all ages)	0.214***		0.214***		0.214***		0.214***		0.214***	
	(0.035)		(0.035)		(0.035)		(0.035)		(0.035)	
Planned × Exposure (ages 0–9)		0.221***		0.221***		0.221***		0.221***		0.221***
		(0.035)		(0.035)		(0.035)		(0.035)		(0.035)
Planned × Exposure (ages 10–19)		0.210***		0.210***		0.210***		0.210***		0.210***
		(0.037)		(0.037)		(0.037)		(0.037)		(0.037)
Planned × Exposure (ages 20–35)		0.213***		0.213***		0.213***		0.213***		0.213***
		(0.038)		(0.038)		(0.038)		(0.038)		(0.038)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,051	6,051	6,051	6,051	6,051	6,051	6,051	6,051	6,051	6,051
Mean of outcome	0.035	0.035	0.753	0.753	0.017	0.017	0.003	0.003	0.050	0.050
KP F-statistic	38.29	10.46	38.29	10.46	38.29	10.46	38.29	10.46	38.29	10.46

Notes: Results from a modified form of Equation 1.4. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A6: Alternate Measures of Damage

	Log+1 Death Ratio		Log+1 Dehousing Ratio		Log+1 Bomb Tonnage per Household	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands
Panel A: Second stage						
Damage × Exposure (all ages)	-7.165***		-0.160***		-1.122**	
	(2.559)		(0.058)		(0.436)	
Damage × Exposure (ages 0–9)		-7.336***		-0.165***		-1.152***
		(2.388)		(0.055)		(0.393)
Damage × Exposure (ages 10–19)		-8.094*		-0.181*		-1.246*
		(4.199)		(0.096)		(0.687)
Damage × Exposure (ages 20–35)		-2.665		-0.059		-0.425
		(8.597)		(0.183)		(1.432)
Panel B: First stage						
Planned × Exposure (all ages)	0.007***		0.294***		0.042***	
	(0.001)		(0.045)		(0.006)	
Planned × Exposure (ages 0–9)		0.007***		0.296***		0.043***
		(0.001)		(0.045)		(0.006)
Planned × Exposure (ages 10–19)		0.007***		0.294***		0.043***
		(0.001)		(0.048)		(0.005)
Planned × Exposure (ages 20–35)		0.006***		0.300***		0.039***
		(0.001)		(0.049)		(0.007)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,409	17,409	17,409	17,409	17,409	17,409
Mean of outcome	0.102	0.102	0.102	0.102	0.102	0.102
KP F-statistic	54.89	16.85	45.22	13.49	52.68	10.14

Notes: Results from a modified form of Equation 1.4. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.

Table A7: Placebo Tests

	Placebo 1955		Placebo 1965		Placebo 1975		Placebo 1985	
	(1) Overall	(2) Sub-bands	(3) Overall	(4) Sub-bands	(5) Overall	(6) Sub-bands	(7) Overall	(8) Sub-bands
Panel A: Second stage								
Damage × Exposure (all ages)	0.033		0.046		0.035		0.041	
	(0.061)		(0.044)		(0.073)		(0.093)	
Damage × Exposure (ages 0–9)		0.033		0.046		0.019		0.042
		(0.061)		(0.069)		(0.075)		(0.117)
Damage × Exposure (ages 10–19)				0.047		0.056		0.041
				(0.058)		(0.087)		(0.091)
Panel B: First stage								
Planned × Exposure (all ages)	0.215***		0.218***		0.220***		0.212***	
	(0.035)		(0.035)		(0.035)		(0.035)	
Planned × Exposure (ages 0–9)		0.215***		0.215***		0.221***		0.222***
		(0.035)		(0.035)		(0.035)		(0.035)
Planned × Exposure (ages 10–19)				0.215***		0.216***		0.222***
				(0.035)		(0.035)		(0.035)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,710	11,710	11,710	11,710	8,232	8,232	5,464	5,464
Mean of outcome	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
KP F-statistic	37.44	37.44	38.70	19.24	40.27	20.23	37.03	18.50

Notes: Results from a modified form of Equation 1.4. Standard errors clustered at the age-15 city × prefecture level in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Sample restricted to respondents born in their birth prefecture and excluding evacuation prefectures.