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Income support policies and firearm violence prevention: A scoping review

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Abstract

Firearm violence is a major threat to global public health and safety. Several individual, family, peer, community, and societal risk and protective factors determine or modify the risk of firearm violence. Specifically, there is a strong relationship between poverty, income inequality, and firearm violence; as such, interventions that influence upstream determinants of health by providing income support may hold much promise in affecting multiple domains of risk that are on the causal pathway to firearm violence. Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews, we conducted a scoping review to examine the current state of evidence on the relationship between income support policies and risk of firearm violence. We searched 8 databases related to health and social sciences from inception through March 30, 2022, and placed no time, language, setting, or other publication restrictions on our search, as long as the study was quantitative or mixed-methods and addressed firearm violence specifically, rather than violence more broadly, as an outcome in relation to income support policies. We found 4 studies; of those, 3 were conducted in the United States and 1 in Brazil. All 4 found associations of policy-relevant magnitude between income support policies and reductions in risk of inter-personal firearm violence. We propose future opportunities to enhance the substantive scope and methodologic rigor of this field of research and inform policy and practice for greater impact.

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Ali Rowhani-Rahbar: Conceptualization, Methodology, Data Curation, Original Draft Preparation, Writing, Reviewing, Editing, Supervision.

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Ali Rowhani-Rahbar reports funds outside of this work for research on firearms from the Centers for Disease Control and Prevention, National Institutes of Health, National Collaborative on Gun Violence Research, Fund for Safer Future, and State of Washington. Frederick Rivara reports funds outside of this work for research on firearms from the National Institutes of Health, National Collaborative on Gun Violence Research, and State of Washington. Julia Schleimer, Caitlin Moe, and Heather Hill do not report any potential competing interests.

Keywords

Income; Poverty; Firearms; Guns; Violence; Social; Public; Policy

1. Background

Firearm-related harm is a major global health and public safety concern. Worldwide estimates suggest that about 250,000 people die each year from firearm injuries sustained in the form of assault, self-inflicted harm, unintentional shooting, or shooting by law enforcement (Naghavi et al., 2018). While formal statistics are unavailable, it is estimated that for every 1 person who dies from firearm injury, another 3–4 are non-fatally wounded with a firearm and live with its devastating physical health, mental health, and economic consequences (Amnesty International, 2022; Vella et al., 2020). At each cross-section of time, about 2 million people are living with a firearm injury globally (Amnesty International, 2022). Still, many more individuals are estimated to be exposed to firearm violence and suffer from the negative consequences of their traumatic experiences, such as being threatened or seeing someone else shot, even if they do not sustain firearm injuries themselves (Leibbrand et al., 2021; Mitchell et al., 2021; Sen-Crowe et al., 2021; Werbick et al., 2021). Firearms are also frequently the weapon of choice involved in serious crimes (United Nations Office on Drugs and Crime, 2022). The global distribution of the burden of firearm-related harm is highly clustered. For instance, 6 countries (Brazil, United States, Mexico, Colombia, Venezuela, and Guatemala) account for 50% of all firearm deaths (Naghavi et al., 2018).

Evaluating programs and policies that are designed to directly prevent firearm violence (e.g., gun laws) is important. Nonetheless, it is also imperative to acknowledge that several inter-related individual, family, peer, community, and societal risk and protective factors could determine or modify the risk of firearm violence (Centers for Disease Control and Prevention, 2022). The uneven distributions of these factors across different settings and communities have been shaped and are perpetuated by specific social policies and structures (World Health Organization, 2022a). For example, studies in sociology, criminology, and public health have long found association of neighborhood characteristics, including concentrated poverty and relative economic disadvantage (i. e., income inequality), collective efficacy, and the design and use of public space, with crime and violence generally (Gobaud et al., 2022; Sampson, 2002). The “neighborhood effects” literature has led to a variety of individual, family, and community-based interventions designed to alter social context and reduce crime and violence, particularly among youth. For instance, the *Moving to Opportunity* program was a randomized controlled trial in the United States that provided housing subsidies to low-income families if they moved to a lower-poverty neighborhood. The treatment reduced arrests for violent crimes among youth, although the effects attenuated over time (Sciandra et al., 2013).

This literature has demonstrated a strong association of both absolute poverty and income inequality with firearm violence specifically. Unequal distribution of resources and social opportunities, coupled with ready availability of firearms, could lead to high rates of

firearm violence, even in high- or middle-income countries. Prior evidence has shown that the association between firearm availability and firearm homicide is especially devastating among communities with greater socioeconomic disadvantage (Semenza et al., 2021). For example, in the United States, about 1 in 2 firearm deaths and 2 in 3 firearm homicides among children and young adults aged 5–24 years are associated with living in an area with a high concentration of poverty (Barrett et al., 2022). Similarly, it has been shown that a one-standard deviation increase in Gini coefficient, a measure of income inequality, is associated with about 9% increase in county-level rates of firearm homicide among individuals aged 14–39 years (Rowhani-Rahbar et al., 2019a).

These associations translate to substantial societal costs considering the large number of individuals affected by socioeconomic disadvantage. For example, nearly 1 in 6 children younger than 18 years and 1 in 5 adults aged 18 to 24 years in the United States live in poverty, defined as annual income <\$26,172 for a family of 4 (Children’s-Defense-Fund, 2021; Statistica, 2021). Further, poverty is disproportionately experienced by non-Hispanic Black children, Indigenous children, and Hispanic children compared with non-Hispanic White children. (Children’s-Defense-Fund, 2021). These very groups also disproportionately sustain the greatest burden of firearm-related harm. For example, firearm homicide is the leading and second leading cause of death among non-Hispanic Black and Hispanic youth aged 15–24 years, with rates that are 20-fold and 5-fold greater than that of age-matched non-Hispanic White youth, respectively (Centers for Disease Control and Prevention, 2021). Indigenous youth aged 10–24 years have the highest rate of firearm suicide than all other racial groups (Centers for Disease Control and Prevention, 2021). The risk of firearm violence varies across intersections of race and gender and so too access to income support policies because it is tied to family attachment and history of involvement in the criminal legal system. Men are less likely than women to receive welfare support, and Black men in particular may not see these benefits due to their over-incarceration and other structural barriers (Gutierrez, 2018). In the United States, for example, several states collect child support payments from non-custodial parents whose children receive welfare (National Conference of State Legislatures, 2020), and due to incarceration and employment disparities, Black men may be more likely than White men to be held responsible for accumulating child support (Mincy et al., 2011).

These inequities are due to historical and ongoing structural racism and systems of oppression (e.g., in housing, the criminal legal system, education, health care, and employment) that deny people of color from equal opportunity to thrive (Bailey et al., 2017). For example, historical redlining has been shown to be a determinant of contemporary firearm violence, including via pathways of poverty and economic disadvantage (Jacoby et al., 2018; Poulson et al., 2021). As such, equity-centered, anti-racist, and effective solutions and policy reform to undo these harms and reduce the burden of firearm violence, especially among vulnerable, minoritized, and disadvantaged communities, are needed.

Considering the observed associations of poverty and income inequality with firearm violence, the past few years have seen increasing calls for research to better understand whether and how the risk of firearm violence may change in response to the introduction and adoption of income support policies (Barrett et al., 2022; Durkin et al., 2020; Ellyson

et al., 2022; Kim, 2019). Income support policies, which provide cash assistance to families with low incomes or earnings, have the potential to reduce poverty and inequality and affect multiple health and social resources (e.g., healthcare, housing). In fact, compared to “in-kind benefits” (i.e., goods and services provided directly or through targeted subsidization), income support in the form of cash offers greater flexibility and autonomy for families to meet their unique needs and improve their economic circumstances (The Hamilton Project, 2021). For example, the income support programs, including Social Security and the Earned Income Tax Credit, are some of the most successful anti-poverty interventions in the United States. Therefore, research on income support policies could provide broad theoretical and practical insights into the influence of social and structural conditions on firearm violence.

To our knowledge, there is little research on evaluating interventions designed to directly improve individual, family, or community economic circumstances through cash benefits as a primary prevention strategy against exposure to, or involvement in, firearm violence specifically. Interventions that influence upstream determinants of health by providing economic support may hold much promise in affecting multiple domains of risk that are on the causal pathway to firearm violence; specifically, income support policies that are means-tested and provide aid to those on the lower end of the income distribution may address relative, along with absolute, economic deprivation. The postulated causal pathways by which poverty and income inequality could lead to higher risk of firearm violence victimization or perpetration are complex and span across multiple levels of the social ecological model including individual, household, community, and societal factors. Some of the downstream influences of poverty and income inequality that could, in turn, elevate the risk of firearm violence include increased exposure to toxic stress, relationship conflict, adverse experiences from childhood to adulthood, inadequate housing, limited access to quality education, healthcare, social services, and safe and well-resourced neighborhoods, compromised social cohesion, reduced social capital, and lack of trust (Hay et al., 2007; Heller et al., 2011; Jarjoura et al., 2002; Kennedy et al., 1998; Miller and Votruba-Drzal, 2017).

We conducted a scoping review to examine the current state of evidence on the relationship between income support policies and risk of firearm violence. We believe that this question lends itself well to a scoping review as it addresses the specific indicators of this approach to broadly identify what is known and what is missing on a given topic (Munn et al., 2018). Specifically, we sought to: (1) identify the available evidence for the relationship between income support policies and firearm violence; (2) analyze substantive and methodologic gaps; and (3) enumerate concepts that could be further examined in the future to advance this area of scholarship. The findings of this scoping review provide a basis to facilitate further research on the impact of social programs on firearm violence and inform the development of new policies and refinement of existing policies that may not have been originally designed for the specific purpose of firearm violence prevention.

2. Methods

This scoping review followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-SCR) (Tricco et al., 2018). The study

protocol was not published in advance; however, it is available in the Appendix. This review of the existing literature is not considered human subjects research by the University of Washington Institutional Review Board.

2.1. Literature search

We searched 8 databases related to health and social sciences for articles on income support policies and firearm violence: PubMed, Web of Science, Social Work Abstracts, EMBASE (Elsevier), Criminal Justice Abstracts, CINAHL Complete, Social Services Abstracts, and SciELO. We placed no time, language, setting, or other publication restrictions on our search, as long as the study addressed firearm violence specifically, rather than violence more broadly, as an outcome in relation to income support policies. The database search was supplemented by reviewing references of included articles, references citing included articles, and articles known to the research team. For this paper, the search was concluded on March 30, 2022. Search results were downloaded, de-duplicated with EndNote software (Endnote, 2022), and uploaded to Rayyan software (Ouzzani et al., 2016) for screening.

2.2. Search strategy

Search terms were developed by the research team with input from a University of Washington Health Sciences Librarian. The search included combinations of terms related to income support, firearms, and violence. We restricted our search by including firearm-related terms with a Boolean “AND” operator. The specific search terms for each of the 8 databases are included in the study protocol in the Appendix.

2.3. Screening procedure

Using Rayyan, two authors (ARR and JPS) independently screened titles and abstracts of all deduplicated articles. Decisions were blinded. In this phase, articles were included for further review if they were quantitative or mixed-methods research studies that examined unrestricted cash payments or direct income support (e.g., conditional cash transfer) and violence (broadly defined, i.e., any mechanism, any intent, physical injury or threatened). We excluded articles that only examined “near cash” benefits, such as Supplemental Nutrition Assistance Program, Medicaid, disability insurance, or housing subsidies, or studies that were qualitative only. Articles that were included based on title and abstract screening then underwent independent full-text review by the same two authors who conducted the screening. During this phase, articles were included if they presented empirical results for the association between income support and firearm violence specifically. The authors met to discuss and resolve discrepancies after each review phase. Disagreements or uncertainties were adjudicated and resolved by a third member of the team (FPR or HDH).

2.4. Data items and charting process

Specific data elements extracted from each of the included articles by two authors (ARR and JPS) were author name, study design, study setting, study period, unit of analysis, income support program or policy of interest, the firearm-related outcome of interest, all covariates used in any analyses, analytic strategy, effect size estimates, and the main interpretation of

findings provided by the authors. This information was then organized in tabular format for presentation purposes to facilitate the identification of specific thematic patterns.

3. Results

3.1. Search results

Our database and supplementary searches returned 1083 articles after removing duplicates. We excluded 1017 articles after screening titles and abstracts. The remaining 66 articles underwent full-text review. Of those, 4 articles met our inclusion criteria (Fig. 1). Of those 4 studies, 3 used a cross-sectional design and 1 used a quasi-experimental design (Table 1). We found no randomized trial of the effect of income support on risk of firearm violence. A summary of the 4 included studies is provided below.

3.2. Investigating the effect of social changes on age-specific gun-related homicide rates in new York City during the 1990s (Cerdá et al., 2010)

In this ecologic cross-sectional study, the investigators sought to assess whether changes in firearm-related homicide rates were influenced by changes in a range of social determinants of violence in 74 New York City police precincts in the 1990s. They used pooled time-series data to examine the associations of misdemeanor policing, cocaine consumption, firearm availability, incarceration rates, and alcohol consumption with age-specific firearm homicide rates from 1990 through 1999. They specifically focused on firearm homicides because: (1) previous research had demonstrated distinct trends for firearm versus non-firearm homicide in New York City; and (2) theoretical arguments about the impact of certain social changes such as policing and drug markets were more compatible with firearm homicide than with non-firearm homicide (Fagan et al., 1998). Firearm homicide rates were estimated separately for victims aged 15–24 years (youths), 25–34 years (young adults), and 35 years or older (adults). This was done since the investigators wanted to know, during a time of notable citywide decrease in firearm homicide rates, whether social changes had specific relationships with reductions in age-specific firearm homicide rates.

The investigators used Bayesian hierarchical models with spatial error terms in the analyses. The outcome, exposures, and time-varying covariates were modeled as a change between specific time periods. As one of the covariates in the models, they included receipt of public assistance, obtained from the Human Resources Administration at the community–district level and disaggregated to the precinct, as a measure of time-varying neighborhood disadvantage. The investigators conceptualized welfare receipt as an indicator of disadvantage and interpreted the results from their “change” models as reflecting the health benefits of a welfare safety net, conditional upon baseline levels of disadvantage. They found that receipt of public assistance was associated with fewer firearm homicides for young adults (ages 25–34 years) (posterior median [PM] = -104.20 ; 95% Bayesian confidence interval [BCI] = $-182.0, -26.14$) and adults (ages 35 years and older) (PM = -28.76 ; 95% BCI = $-52.65, -5.01$). One standard deviation (or 10.11%) increase in percentage of the precinct population receiving public assistance was associated with 10.53 fewer homicides per 100,000 for young adults and 2.9 fewer homicides per 100,000 for adults over the study period.

In interpreting the findings, the investigators stated that the association between increases in welfare receipt among neighborhood residents and reductions in homicide may reflect the benefits of welfare cash assistance in reducing exposure to environmental stressors and situations that place individuals at high risk of firearm violence victimization or perpetration stemming from poverty and racism (Hannon and Defronzo, 1998). This study was funded by the National Institute on Drug Abuse (grants DA 06354 and DA 017642) and the Robert Wood Johnson Foundation.

3.3. Geographies of violence: A spatial analysis of five types of homicide in Brazil's municipalities (Ingram and de Costa, 2015)

In this ecologic lagged cross-sectional study, the investigators sought to examine the spatial distribution of homicide across Brazil's 5562 municipalities in 2011 and test the effects of family disruption, marginalization, poverty-reduction programs, and environmental degradation on risk of homicide. Notably, Brazil leads the world in firearm injury deaths, and in 2011, firearms were used in about 70% of all homicides (Gun Policy, 2022; Naghavi et al., 2018). The investigators selected 2011 as the year in which to measure the outcomes because of its proximity to several explanatory variables collected during the decennial year 2010. Explanatory variables for the spatial regressions were from 2009 or 2010.

One of the main explanatory variables was the proportion of poor, eligible families covered by Bolsa Família (BF). BF is one of the most widely regarded poverty reduction programs globally. It is a government program introduced in 2003 by then-president Lula da Silva (Center-For-Public-Impact, 2022). Under BF, low-income families receive cash transfers on certain conditions (e.g., that they, for example, send their children to school and ensure they are properly vaccinated). BF has been shown to successfully reduce levels of inequality and hunger, with significantly fewer people living below the poverty line, and closing the historical rural-urban poverty gap (Center-For-Public-Impact, 2022). It has also increased the sense of belonging and efficacy; consistent with the sociological literature on collective efficacy, social capital and community resilience may have violence-reduction effects (Hunter and Sugiyama, 2014; Ingram and Curtis, 2014). Additionally, in earlier research, BF had been found to reduce the risk of homicide; however, that investigation did not examine specific types of homicide and did not include spatial components in the analyses (Lance, 2014).

This study examined different types of homicide including aggregate homicides, homicides of women (femicides), firearm homicides, youth homicides, and homicides of victims identified by race as either Black or Brown (nonwhite victims). The study also incorporated spatial analytic techniques. The investigators found that BF coverage had a strong and statistically significant association with reductions in firearm homicide rates (coefficient from Ordinary Least Squares spatial model: -0.002 ; $p < 0.001$). BF coverage was also associated with reductions in rates of youth and nonwhite homicides, but not other types. Notably, however, of all homicide types, BF coverage had the most pronounced effect on firearm homicides and in the anticipated direction. The investigators stated that while it may not help reduce the incidence of all homicides, BF robustly reduces the incidence of firearm homicides specifically.

In interpreting their findings, the investigators stated that cash transfer programs could have a valuable violence-prevention power and that findings of the investigation have clear policy implications. Specifically, conditional cash transfer programs are a promising policy option in the objective to prevent and reduce firearm violence. Portions of this research were funded by the Rockefeller College Research Incentive Fund and the Center for Social and Demographic Analysis at the University at Albany.

3.4. Social determinants of health in relation to firearm-related homicides in the United States: A Nationwide multilevel cross-sectional study (Kim, 2019)

In this multi-level lagged cross-sectional study, the investigator sought to examine the independent associations of specific state, county, and neighborhood-level social determinants of health with neighborhood firearm homicides in the United States. The determinants of interest included social mobility (the ability of children to climb higher on the social ladder than their parents), social capital (reflecting informal and formal social ties within society), income inequality (the divide between the rich and poor), racial and economic segregation (physical separation of two or more groups as defined by race/ethnicity and socioeconomic status into different neighborhoods), and social spending (public welfare, education, protection, and total per capita).

The investigator used multi-level negative binomial regression models and geolocated firearm homicide data from January 1, 2015 to December 31, 2015. The sample spanned 70,579 census tracts containing an estimated 314,247,908 individuals, or 98% of the total population of the United States in 2015. For area-level social determinants, lag periods of 3 to 17 years were examined based on existing theory, empirical evidence, and data availability.

State and local government social spending corresponded to the 2005, 2008, 2010, and 2012 fiscal years as reported by the Annual Survey of State and Local Government Finances. For this study, welfare spending encompassed state supplements for unemployment insurance, workers' compensation, work incentive programs, public assistance programs (e.g., Aid to Families with Dependent Children), and state supplements for the Supplemental Security Income (SSI) program for the aged, blind, and disabled. State and local spending on welfare ranged from \$475 per capita (Alabama) to \$1559 per capita (Massachusetts). One standard deviation increase in welfare spending was associated with 14% lower firearm homicide rates (incidence rate ratio = 0.86; 95% CI: 0.83, 0.90) in models that included covariates for a number of social and economic characteristics of census tracts, commuting zones, counties, and states; commuting zone urbanicity; county property crime rates; state fixed effects; and state gun control policy indicators (Table 1). In models that additionally included community social capital, institutional social capital, and social mobility, the association between welfare spending and firearm homicide attenuated suggesting that some of the effect may be explained or mediated by those factors.

In interpreting the findings, the investigator stated that government spending on social assistance may improve socioeconomic conditions and serves as investment in the social determinants of health and that the added economic security provided by welfare benefits could reduce disadvantage which is a risk factor for exposure to and involvement in firearm

violence victimization and perpetration. The author received no specific funding for this work.

3.5. Firearm and nonfirearm violence after operation peacemaker fellowship in Richmond, California, 1996–2016 (Matthay et al., 2019)

In this quasi-experimental study, the investigators sought to evaluate whether the Operation Peacemaker Fellowship, a firearm violence-prevention program implemented in Richmond, California, was associated with reductions in firearm violence. In the mid-2000s, Richmond was one of the most violent cities in the country, with a homicide rate of 46 per 100,000. Safety concerns led to the creation of the Office of Neighborhood Safety (ONS) in 2007. ONS focused on 30 community-dwelling individuals that the police department believed were responsible for most of Richmond's firearm crimes. ONS invited participation in an intensive 18-month fellowship (i.e., Operation Peacemaker). The core components of Operation Peacemaker are individually tailored mentorship, 24-h case management, cognitive behavioral therapy, internship opportunities, social service navigation, substance abuse treatment, excursions, and stipends up to \$1000 per month for successful completion of specific goals set by the fellowship and ONS staff, including nonparticipation in firearm violence as a conditional cash transfer. Although the program did not specifically focus on firearm availability, acquisition, or use, it delivered a set of socioeconomic and behavioral interventions to prevent involvement in firearm violence.

The investigators compiled city and jurisdiction-level quarterly counts of violent firearm incidents from statewide records of deaths and hospital visits for homicide and assault (2005–2016) and from nationwide crime records of homicides and aggravated assaults (1996–2015). They applied a generalization of the synthetic control method to compare observed patterns in firearm violence after implementation of the program in June 2010 to those predicted in the absence of the program, using a weighted combination of comparison cities or jurisdictions. They found that the program was associated with reductions in firearm violence; they estimated there were 55% fewer firearm deaths and hospital visits for firearm injury as well as 43% fewer firearm crimes annually due to the program.

In interpreting the findings, the investigators stated that the observed changes in rates of firearm violence in Richmond were most likely attributable to the program because other major violence-related changes were offset in time from Operation Peacemaker and the nature and intensity of the program was unique. They stated that between mid-2010 and 2012, Operation Peacemaker was the only organization providing intensive support services of this type to those actively involved with or most at risk for firearm violence. These individuals were also approached by Operation Ceasefire in subsequent years, but the timing of Operation Peacemaker was distinctive, and no other program provided the same level of case management and opportunities, specifically the stipend. Notably, the design of this quasi-experiment does not allow for separately testing the effect of each specific service provided by Operation Peacemaker (e.g., stipend), which means that the specific role of each in reducing firearm violence is unknown. Of note, the Operation Peacemaker Fellowship has continued since then and included more of those suspected to be involved in much of the city's firearm violence to become Fellows (Operation-Peacemaker-Fellowship,

2022). Similar programs have begun or been considered in a few other cities, and public and policy debates about their strengths and limitations continue (The-Guardian, 2016; The-Washington-Post, 2016). This study was funded by Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Office of the Director (grant DP2HD080350), University of California Firearm Violence Research Center, and the University of California, Berkeley Committee on Research.

4. Discussion

To our knowledge, this is the first scoping review of the impact of income support policies on firearm violence. In this scoping review, we found only 4 studies that specifically examined the relationship between income support policies and firearm violence. Of those, 3 were conducted in the United States and 1 in Brazil. All 4 found associations of policy-relevant magnitude between income support policies and reductions in risk of inter-personal firearm violence. This scoping review also provides strong evidence on the striking dearth of studies on this topic globally.

We found several articles from around the world that examined the association of different income support policies with the occurrence of violence but did not specifically investigate firearm violence (Aisa, 2014; Alves et al., 2019; Austin et al., 2022; Barrington et al., 2022; Berman et al., 2011; Bobonis, 2010; Bobonis et al., 2015; Bobonis et al., 2013; Buller et al., 2018; Chakrabarti et al., 2020; Chin, 2012; Chioda et al., 2016; Deshpande and Mueller-Smith, 2022; Diaz and Saldarriaga, 2022; Felter et al., 2016; Hawks, 2022; Hidrobo and Fernald, 2013; Hidrobo et al., 2016; Ismayilova et al., 2018; Kim, 2016; Lance, 2014; Leite et al., 2019; Loureiro, 2012; Machado et al., 2018; Perova, 2010; Ringback Weitoft et al., 2008; Roy et al., 2019; Rudolph and Starke, 2020; Shyne, 2014; Verbruggen et al., 2015; Watson et al., 2020; Wright et al., 2017; Yang, 2017). For instance, several studies (e.g., those pertaining to intimate partner and domestic violence) used instruments (e.g., Conflict Tactic Scale) that included questions on “weapons” including threats and use of firearms, knives, and other means (Bobonis, 2010; Bobonis et al., 2015; Bobonis et al., 2013; Deshpande and Mueller-Smith, 2022; Diaz and Saldarriaga, 2022; Hidrobo et al., 2016; Ismayilova et al., 2018; Perova, 2010; Roy et al., 2019; Verbruggen et al., 2015; Watson et al., 2020). However, those questions were either combined with other items on the instrument under broader composite outcomes (e.g., physical intimate partner violence) or were analyzed as one separate item under the more specific composite outcome of “weapons.” Neither strategy allows for an analytic assessment of the specific association of those programs with firearm violence.

We believe that this is a missed opportunity, especially in settings and countries with high rates of firearm violence. Existing evidence over the past several decades clearly indicates that there are important differences in causes, correlates, and spatiotemporal distributions of firearm violence and those of other forms of violence (Fagan et al., 1998; Matthay et al., 2019). Examining violence without regard to specific means (i.e., instrument) by which it is perpetrated could obscure mechanism-specific etiologic patterns that have a bearing on informing tailored preventive interventions. For instance, the overall crime trend in the United States from 2019 to 2020 was a decreasing one; there were 375,800 fewer serious

crimes in 2020 than in 2019 for a decline of nearly 5% (Cook and Ludwig, 2022). However, murders (most of which involved the use of firearms) increased by 5000 for a rise of about 30% (Pew-Research-Center, 2021). Additionally, the estimated “costs” for public health, public safety, and clinical consequences of firearm violence are notably different from and greater than those of other forms of violence (Miller, 2021; Wolf et al., 2019). Even the fear of firearm violence could profoundly disrupt the way that millions of people live their lives due to its uniquely traumatizing and threatening nature impacting individuals who have directly experienced it as well as their peers, entire communities, and society as a whole (Lowe and Galea, 2017; Rowhani-Rahbar et al., 2019b). Therefore, even in settings in which crime overall may have declined but firearm violence has increased (such as the United States in 2019–2020), the social harm from the rise in firearm violence specifically could more than offset the reduction of several hundred thousand fewer reported total crimes (Cook and Ludwig, 2022). As such, investigating the impact of social programs and public policies on violence that specifically involves firearms is an important priority for the field.

Our scoping review revealed other important opportunities for enhancing our collective understanding of the impact of income support policies on firearm violence. First, much of this literature has focused on inter-personal firearm violence; there is a need for evidence on the impact of these policies on self-directed firearm harm. Many of the causal pathways through which income support could reduce the risk of inter-personal firearm violence may also operate in relation to self-directed firearm harm (e.g., reducing economic stress, relationship conflict, improving mental health). Considering the substantial global burden of self-harm (World Health Organization, 2022b) and case-fatality of suicide attempts by firearms of about 90% (Conner et al., 2019), this is an important area for future research. Second, in several of the countries with the greatest burden of firearm morbidity and mortality, interpersonal firearm violence and collective (i.e., organized or group) firearm violence co-exist. Interpersonal firearm violence and collective firearm violence may present distinct challenges due to their specific risk and modifying factors. For example, a young person may carry and use firearms in events defined as one-to-one inter-personal violence while as a member of an organized gang he can engage with firearms in other ways. If the organized gang is part of the infrastructure of a drug syndicate, for example, the circumstances leading to collective firearm violence might be different from those leading to inter-personal firearm violence. Whether economic support affects these other manifestations of firearm violence should be further explored.

Third, there is a need for multi-level longitudinal studies that use rigorous analyses with suitable lag periods to incorporate the etiologically relevant windows of time and that consider life course development and potential sensitive periods (e.g., childhood) in evaluating the impact of social policies on firearm violence. Relatedly, studies should examine potential effects at various theoretically relevant units of analysis (e.g., among individuals, families, communities), considering the exposure mechanism, potential spillover effects, and the social nature of firearm violence (Green et al., 2017; Matthay and Glymour, 2022). Ideally, these studies should make use of causal mediation analyses to shed light on mechanisms by which these policies may impact firearm violence and evaluate variation in or specific components of policies which may have different effects such as conditional vs. unconditional cash transfers or “cash plus” interventions (Little et al., 2021).

Quasi-experimental studies that utilize variations from policies impacting income support or welfare spending in different settings and evaluate their effect on different forms of firearm violence are especially needed. Fourth, income support policies do not take place in isolation. A wide range of other social policies (e.g., assistance for food, transportation, and housing) as well as firearm-specific policies (i.e., gun laws) may also be concurrently operational in certain settings. Rigorous evaluations of the independent and joint effects of these policies would benefit decision-making in prioritizing firearm violence prevention resources (Matthay et al., 2022a; Matthay et al., 2022b). Fifth, income support policies may not affect all populations equally (Collyer et al., 2019). The policies that make people ineligible based on prior felony status, for example, could lead to the premature mortality of people entrapped by the criminal legal system. In the United States, for example, felony drug convictions disqualify individuals from receiving certain income support policies such as Temporary Assistance for Needy Families (Center for Law and Social Policy, 2022). Some states even have drug testing requirements for receipt of welfare and public assistance (National Conference of State Legislatures, 2017). Such eligibility requirements further reinforce inequities and harm minoritized populations. Due to the disproportionate punishment of Black and Brown people, the disqualification of those with felonies further contributes to racial disparities in health. Research should seek to further identify how such policies intersect with various dimensions of privilege and disadvantage which are related to, but distinct from, economic position (e.g., racism) and whether income support policies specifically reduce inequities in, along with overall levels of, firearm violence. Sixth, quantitative research should be paired with qualitative research to further illuminate how and why income support policies have an impact (or not) on firearm violence and how such policies may be refined and improved. Elucidating the specific causal pathways by which these programs influence firearm violence could lead to better tailoring of these interventions for greatest impact. Seventh, there might be opportunities for assessing firearm violence as an outcome in several ongoing or past studies of income support and poverty reduction programs globally. These programs typically evaluate a range of domains related to health and well-being; as such, the inclusion of firearm violence as an outcome could be considered and done for little incremental cost.

5. Limitations

Our scoping review is subject to some limitations. First, we restricted our search by including firearm-related terms with a Boolean ‘AND’ operator to improve its specificity; however, this also means that we may have missed articles that included firearm outcomes in a table or supplement but could not be identified as firearm-related from the title, abstract, or citation fields. Second, our findings and conclusions should not necessarily be generalized to all social programs. We restricted our attention specifically to income support policies and did not include other social programs that provide “in-kind” benefits (e.g., Supplemental Nutrition Assistance Program, Medicaid, disability insurance, or housing subsidies). There are indeed studies in the literature that examined the effect of those policies on firearm violence that were not included in this review (Choi et al., 2020). Third, as in one of the studies included in our review (Cerdá et al., 2010), there may have been other studies examining income support as a covariate (and not the main exposure) in a model focused on

assessing the impact of other exposures (e.g., a gun law) on firearm violence. Such studies too were not included in our scoping review if there was no mention of income support policies (and all their variants, as shown in the Appendix) in their title or abstract or citation fields.

6. Conclusion

Robust theory supports the notion that social policies designed to target well-known and established risk and protective factors for firearm violence could reduce its burden. In this scoping review of empiric research, we focused on income support as one type of such social policy. Our rationale was that more generous and expansive income support policies could reduce stressors in the environment, provide access to good-quality housing and health care, increase educational attainment, improve community stability and safety, and lead to the intergenerational accumulation of wealth, with a net impact on reducing firearm violence. We found only 4 studies that had examined the impact of income support on reducing firearm violence, all of which demonstrated significant effects. Our review revealed major gaps in our knowledge in this area of scholarship and identified opportunities to build this nascent body of literature. Developing, implementing, refining, and evaluating programs, policies, and systems to support income may provide additional tools, beyond gun laws, to reduce the burden of firearm violence globally.

Funding

This study was not supported by any specific funds.

Appendix: Income Support Policies and Firearm Violence Prevention: A Scoping Review.

Appendix Table 1

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.

Section	Item	PRISMA-ScR checklist item	Reported on page #
Title Title Abstract	1	Identify the report as a scoping review.	1
Structured summary	2	Provide a structured summary that includes (as applicable): Background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
Introduction Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3–4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4–5
Methods Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a web address); and if available, provide registration information, including the registration number.	6

Section	Item	PRISMA-ScR checklist item	Reported on page #
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6–7
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	6–7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Appendix
Selection of sources of evidence [†]	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7–8 and appendix and Fig. 1
Data charting process [‡]	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7–8 and appendix
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	7–8 and Table 1
Critical appraisal of individual sources of evidence [§]	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	NA
Synthesis of results Results	13	Describe the methods of handling and summarizing the data that were charted.	8
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Fig. 1
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	8
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	NA
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	8–15 and Table 1
Synthesis of results Discussion	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	15
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	15–18
Limitations	20	Discuss the limitations of the scoping review process.	19
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	20
Funding Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	1, 10–15

JBIC = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

[†]A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

[‡]The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

[§]The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and web sites.

Study Protocol

Methods

This scoping review protocol followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. The study protocol has not been published.

This review will characterize empirical research on income support policies and firearm violence. To capture the fullest breadth of evidence, we will place no time, language, or other publication restrictions on our review. The aims are to examine the types of evidence on income support policies and firearm violence, describe the policies that have been studied and how the research has been conducted, and identify gaps in knowledge.

Data Sources and Search Strategy.—We will systematically search 8 databases related to health and social sciences for articles on income support policies and firearm violence: PubMed, Web of Science, Social Work Abstracts, EMBASE (Elsevier), Criminal Justice Abstracts, CINAHL Complete, Social Services Abstracts, and SciELO. Additional detail on each database is included in Appendix Table 2. Our research team will develop a search strategy with input from a University of Washington Health Sciences Librarian. The search will include combinations of terms related to income support, firearms, and violence, and it will use both controlled vocabulary terms and general key word searches. We will restrict our search by including firearm-related terms with a Boolean ‘AND’ operator; this will help narrow our results to a manageable number, though it means we may miss articles that include firearm outcomes in a table or supplement but cannot be identified as firearm-related from the title, abstract, or citation fields. The search terms for each database are shown in Appendix Table 3. Our team will supplement the systematic database search by reviewing references of included articles and references citing included articles and including articles known to the research team.

Inclusion and Exclusion Criteria.—Articles eligible for inclusion are those that quantitatively examine unrestricted cash payments or direct income support and firearm violence (broadly defined, i.e., any intent, physical injury or threatened). We will include quantitative or mixed-method research studies as long as the study presents an effect size estimate for the association between income support policies and firearm violence. We will include income support policies that provide direct cash payment from government sources, commonly termed cash transfers, public assistance, or welfare. Articles need not be peer-reviewed.

We will exclude articles that only examined “near cash” benefits, such as Supplemental Nutrition Assistance Program, Medicaid, disability insurance, or housing subsidies. These programs do not provide cash payments, but rather help with pay exclusively for necessities such as housing, food, transportation, or healthcare.

Screening.—Search results will be exported, de-duplicated with EndNote software, and uploaded to Rayyan for screening. Two authors will independently screen each article for inclusion. Decisions will be blinded. In this phase, articles will be included for further review if they examine income support policies and violence by any mechanism. The same two authors will then independently review the full text of articles included after title and abstract screening. During this second phase, articles will be included if they present empirical results for the association between income support policies and firearm violence. Decisions will not be blinded. The authors will meet regularly to discuss progress and resolve discrepancies.

Data extraction and coding.—Two authors will extract data from each included article. Extracted data elements will include author name, study design, study setting, study period, unit of analysis, income support program or policy of interest, firearm-related outcome of interest, all covariates used in any analyses, analytic strategy, effect size estimates, and the main interpretation of findings provided by the authors. Studies will be described individually in tabular format.

Appendix Table 2
Database Descriptions.

Database	Topic area(s)	Temporal coverage
PubMed	Biomedical and life sciences	1996 (and selectively to 1809)-present
Web of science	Sciences, social sciences, arts, and humanities	1900-present
Social work abstracts	Social work, social welfare, humanities	1965-present
EMBASE (Elsevier)	Biomedicine	1947 (and selectively to 1902)-present
Criminal justice abstracts	Criminal justice and criminology	1968-present
CINAHL complete	Nursing, biomedicine, healthcare	1937-present
Social services abstracts	Social work, social welfare, humanities	1979-present
SciELO	Scientific articles from Spain, Portugal, and several central American, south American, and Caribbean countries	1997-present

Appendix Table 3

Search Strategy.

Database	Search strategy	Notes
PubMed	((income[MeSH terms] OR income[title/abstract]) AND (supplemental[title/abstract] OR supplementation[title/abstract] OR supplement[title/abstract] OR maintenance[title/abstract] OR benefit[title/abstract] OR benefits[title/abstract] OR support[title/abstract])) OR conditional cash[title/abstract] OR unconditional cash[title/abstract] OR cash transfer[title/abstract] OR cash[title/abstract] OR money[title/abstract] OR voucher [title/abstract] OR vouchers[title/abstract] OR financial assistance[title/abstract] OR stipend[title/abstract] OR public assistance[MeSH terms] OR (public[title/abstract] AND assistance[title/abstract]) OR ((unemployment[MeSH terms]) AND (benefit[title/abstract] OR benefits[title/abstract] OR insurance[title/abstract])) OR social welfare [MeSH terms] OR welfare[title/abstract] OR aid to families with dependent children[title/abstract] OR temporary assistance for needy families[title/abstract] OR child tax credit [title/abstract] OR earned income tax credit[title/abstract] OR supplemental security income[title/abstract] OR negative income tax experiment[title/abstract] OR Canadian self-sufficiency project[title/abstract]	

Database	Search strategy	Notes
	OR new hope project[title/abstract] OR child benefit[title/abstract] OR universal basic[title/abstract] OR paid family leave[title/abstract] OR paid maternity leave[title/abstract] OR advance peace[title/abstract] OR peacemaker fellowship[title/abstract] OR Bolsa Familia[title/abstract] OR bono de Desarrollo Humano[title/abstract] OR Oportunidades[title/abstract] OR Progresa[title/abstract] OR Prospera[title/abstract] OR Juntos[title/abstract] OR Niger Delta amnesty [title/abstract] OR Pantawid Pamilyang[title/abstract] OR Pantawid Pamilya[title/abstract] OR paid medical leave[title/abstract] OR Alaska permanent fund[title/abstract] OR social security disability insurance[title/abstract] OR tribal payment[title/abstract]) AND (firearms[MeSH terms] OR firearm[title/abstract] OR gun[title/abstract] OR guns [title/abstract] OR gunshot[title/abstract] OR "wounds, gunshot"[MeSH terms] OR "gunshot wounds"[title/abstract] OR gunshot[title/abstract] OR handgun[title/abstract] OR handguns[title/abstract] OR ((hand[MeSH terms] OR hand[title/abstract]) AND (firearms[MeSH terms] OR firearms[title/abstract] OR gun[title/abstract])) OR (long [title/abstract] AND (firearms[MeSH terms] OR firearms[title/abstract] OR gun[title/abstract])) OR shotgun[title/abstract] OR shotguns[title/abstract] OR rifle[title/abstract] OR rifles[title/abstract]) AND (violence[MeSH terms] OR violence[title/abstract] OR homicidal[title/abstract] OR homicide[MeSH terms] OR homicide[title/abstract] OR homicides[title/abstract] OR "suicidal ideation"[MeSH terms] OR "suicidal ideation"[title/abstract] OR suicidality[title/abstract] OR suicidal[title/abstract] OR suicide[MeSH terms] OR suicide[title/abstract] OR suicides[title/abstract] OR injurie [title/abstract] OR injured[title/abstract] OR "injuries"[subheading] OR injuries[title/abstract] OR "wounds and injuries"[MeSH terms] OR injurious[title/abstract] OR injury [title/abstract] OR mortality[MeSH terms] OR mortality[title/abstract] OR "mortality"[subheading] OR death[MeSH terms] OR death[title/abstract] OR deaths [title/abstract] OR shooting[title/abstract] OR shootings[title/abstract] OR shot[title/abstract] OR crime[MeSH terms] OR crime[title/abstract] OR crimes[title/abstract] OR "crime victims"[MeSH terms] OR (crime[title/abstract] AND victims[title/abstract]) OR victimization[title/abstract] OR victimization[title/abstract] OR victim[title/abstract] OR victimizing[title/abstract] OR victimizing[title/abstract] OR victimizations[title/abstract] OR victimisations[title/abstract] OR victimize[title/abstract] OR victimized [title/abstract] NOT (animals[MeSH terms] NOT humans[MeSH terms])	
Web of science	(AB = ((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*))) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresa OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) OR TI = ((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*))) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresa OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) OR TS = ((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*))) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresa OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment)) AND (AB = (firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*) OR TI = (firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*) OR TS = (firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*)) AND (AB = (violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) OR TI = (violence OR homicid* OR suicid* OR injur*	

Database	Search strategy	Notes
	OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) OR TS = (violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) NOT (AB = (animal) OR TI = (animal) OR TS (animal))	
Social work abstracts	(AB((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) OR TI((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment)) AND (AB(firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*) OR TI(firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*)) AND (AB(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) OR TI(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*)) NOT (AB(animal*) NOT AB (human*))	With search options for Boolean/phrase and "apply related words" and "apply equivalent subjects"
EMBASE (Elsevier)	('conditional cash transfer'/exp. OR 'conditional cash transfer program'/exp. OR (income: Ab,ti AND (supplement*:Ab,ti OR 'maintenance'/exp. OR benefit*:Ab,ti OR support:Ab,ti)) OR 'public assistance'/exp. OR ('unemployment'/exp. AND (benefit*:Ab,ti OR insur*:Ab,ti)) OR 'unemployment insurance'/exp. OR 'social welfare'/exp. OR 'social care'/exp. OR 'conditional cash':Ab,ti OR 'unconditional cash':Ab,ti OR 'cash transfer':Ab,ti OR cash: Ab,ti OR money:Ab,ti OR voucher*:Ab,ti OR 'financial assistance':Ab,ti OR stipend:Ab,ti OR welfare:Ab,ti OR 'aid to families with dependent children':Ab,ti OR 'temporary assistance for needy families':Ab,ti OR 'child tax credit':Ab,ti OR 'earned income tax credit':Ab,ti OR 'supplemental security income':Ab,ti OR 'negative income tax experiment':Ab,ti OR 'Canadian self-sufficiency project':Ab,ti OR 'new hope project':Ab,ti OR 'child benefit':Ab,ti OR 'universal basic':Ab,ti OR 'paid family leave':Ab,ti OR 'paid maternity leave':Ab,ti OR 'advance peace':Ab,ti OR 'peacemaker fellowship':Ab,ti OR 'bolsa familia':Ab,ti OR 'bono de desarrollo humano':Ab,ti OR oportunidades:Ab,ti OR progresora:Ab,ti OR prospera:Ab,ti OR juntos:Ab,ti OR 'Niger delta amnesty':Ab,ti OR 'pantawid pamilyang':Ab,ti OR 'pantawid pamilya':Ab,ti OR 'paid medical leave':Ab,ti OR 'Alaska permanent fund':Ab,ti OR 'social security disability insurance':Ab,ti OR 'tribal payment':Ab,ti) AND ('firearm'/exp. OR 'gun'/exp. OR 'gun violence'/exp. OR 'gunshot injury'/exp. OR firearm*:Ab,ti OR gun*:Ab,ti OR gunshot:Ab,ti OR 'gunshot wound':Ab,ti OR handgun*:Ab,ti OR 'long gun':Ab,ti OR shotgun*:Ab,ti OR rifle (weapon)':Ab,ti) AND ('violence'/exp. OR 'homicide'/exp. OR 'suicidal ideation'/exp. OR 'suicidal behavior'/exp. OR 'suicide'/exp. OR 'mortality'/exp. OR 'death'/exp. OR 'crime'/exp. OR 'crime victims'/exp. OR violence:Ab,ti OR homicid*:Ab,ti OR suicid*:Ab,ti OR injur*:Ab,ti OR wound*:Ab,ti OR mortalit*:Ab,ti OR death*:Ab,ti OR shoot*:Ab,ti OR shot*:Ab,ti OR crime*:Ab,ti OR victim*:Ab,ti) NOT (animal*:Ab NOT human*:Ab)	
Criminal justice abstracts	(AB((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) OR TI((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend	With search options for Boolean/phrase and "apply related words," "apply equivalent subjects," and "also search within the

Database	Search strategy	Notes
	OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR child benefit OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) AND (AB (firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle* OR TI(firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*)) AND (AB(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) OR TI(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*)) NOT (AB (animal*) NOT AB(human*)))	full text of the articles"
CINAHL complete	((MH "income+") OR (MH "insurance, unemployment") OR (MH "public assistance+") OR (MH "unemployment") OR (MH "insurance benefits") OR (MH "insurance, disability+") OR (MH "social welfare+") OR AB((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) OR TI((income AND (supplement* OR maintenance OR benefit* OR support)) OR conditional cash OR unconditional cash OR cash transfer OR cash OR money OR voucher* OR financial assistance OR stipend OR public assistance OR (unemployment AND (benefit* OR insur*)) OR social welfare OR welfare OR aid to families with dependent children OR temporary assistance for needy families OR child tax credit OR earned income tax credit OR supplemental security income OR negative income tax experiment OR Canadian self-sufficiency project OR new hope project OR universal basic OR paid family leave OR paid maternity leave OR advance peace OR peacemaker fellowship OR Bolsa Familia OR bono de Desarrollo Humano OR Oportunidades OR Progresora OR Prospera OR Juntos OR Niger Delta amnesty OR Pantawid Pamilyang OR Pantawid Pamilya OR paid medical leave OR Alaska permanent fund OR social security disability insurance OR tribal payment) AND ((MH "gun violence") OR (MH "firearms") OR (MH "wounds, gunshot") OR (AB(firearm* OR gun* OR gunshot OR gunshot wound OR handgun* OR long gun* OR shotgun* OR rifle*)) AND ((MH "violence+") OR (MH "homicide+") OR (MH "suicide+") OR (MH "wounds and injuries+") OR (MH "mortality+") OR (MH "death+") OR (MH "crime+") OR (MH "victims+") OR (MH "crime victims") OR (AB(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*) OR TI(violence OR homicid* OR suicid* OR injur* OR wound* OR mortalit* OR death* OR shoot* OR shot* OR crime* OR victim*))) NOT (AB(animal*) NOT AB (human*)))	With search options for Boolean/phrase and "apply related words" and "also search within the full text of the articles" and "apply equivalent subjects"
Social services abstracts	(MAINSUBJECT.EXACT.EXPLODE("income maintenance programs") OR MAINSUBJECT. EXACT.EXPLODE("income distribution") OR ((MAINSUBJECT.EXACT.EXPLODE ("benefits") OR ab(insurance) OR ti(insurance)) AND MAINSUBJECT.EXACT.EXPLODE ("unemployment")) OR MAINSUBJECT.EXACT("welfare recipients") OR MAINSUBJECT. EXACT("welfare dependency") OR MAINSUBJECT.EXACT("welfare reform") OR MAINSUBJECT.EXACT("welfare services") OR MAINSUBJECT.EXACT("welfare state") OR ab(conditional cash) OR ab(unconditional cash) OR ab(cash transfer) OR ab(cash) OR ab(money) OR ab(voucher) OR ab(vouchers) OR ab(financial assistance) OR ab(stipend) OR ab(public assistance) OR ab(aid to families with dependent children) OR ab(temporary assistance for needy families) OR ab(child tax credit) OR ab(earned income tax credit) OR ab(supplemental security income) OR ab(negative income tax experiment) OR ab (Canadian self-sufficiency project) OR ab(new hope project) OR ab(child benefit) OR ab (universal basic) OR ab(paid family leave) OR ab(paid maternity leave) OR ab(advance peace) OR ab(peacemaker fellowship) OR ab(Bolsa Familia) OR ab(bono de Desarrollo Humano) OR ab(Oportunidades) OR ab(Progresora) OR ab(Prospera) OR ab(Juntos) OR ab (Niger Delta amnesty) OR ab(Pantawid Pamilyang) OR ab(Pantawid Pamilya) OR ab(paid medical leave) OR ab(Alaska permanent fund) OR ab(social security disability insurance) OR ab(tribal payment) OR ti(conditional cash) OR ti(unconditional cash) OR ti(cash transfer) OR ti(cash) OR ti(money) OR ti(voucher) OR ti(vouchers) OR ti(financial assistance) OR ti(stipend) OR ti(public assistance) OR ti(aid to families with	

Database	Search strategy	Notes
	<p>dependent children) OR ti(temporary assistance for needy families) OR ti(child tax credit) OR ti(earned income tax credit) OR ti(supplemental security income) OR ti(negative income tax experiment) OR ti(Canadian self-sufficiency project) OR ti(new hope project) OR ti(child benefit) OR ti(universal basic) OR ti(paid family leave) OR ti(paid maternity leave) OR ti(advance peace) OR ti(peacemaker fellowship) OR ti(Bolsa Familia) OR ti(bono de Desarrollo Humano) OR ti(Oportunidades) OR ti(Progresa) OR ti(Prospera) OR ti(Juntos) OR ti(Niger Delta amnesty) OR ti(Pantawid Pamilyang) OR ti(Pantawid Pamilya) OR ti(paid medical leave) OR ti(Alaska permanent fund) OR ti(social security disability insurance) OR ti(tribal payment) AND (MAINSUBJECT.EXACT.EXPLODE("firearms")) OR ab(gun) OR ab(gunshot) OR ab(gunshot wound) OR ab(handgun) OR ab(long gun) OR ab(shotgun) OR ab(rifle) OR ti(gun) OR ti(gunshot) OR ti(gunshot wound) OR ti(handgun) OR ti(long gun) OR ti(shotgun) OR ti(rifle) AND (MAINSUBJECT.EXACT.EXPLODE("violence")) OR MAINSUBJECT.EXACT.EXPLODE("homicide") OR MAINSUBJECT.EXACT.EXPLODE("suicide") OR MAINSUBJECT.EXACT.EXPLODE("injuries") OR MAINSUBJECT.EXACT.EXPLODE("victimization") OR MAINSUBJECT.EXACT.EXPLODE("mortality rates") OR "shooting" OR MAINSUBJECT.EXACT.EXPLODE("crime rates") OR MAINSUBJECT.EXACT.EXPLODE("crime prevention") OR MAINSUBJECT.EXACT.EXPLODE("crime") OR ab(suicidal ideation) OR ab(homicidal) OR ab(homicidal ideation) OR ab(wound) OR ab(shoot) OR ab(shooting) OR ab(shot) OR ti(suicidal ideation) OR ti(homicidal) OR ti(homicidal ideation) OR ti(wound) OR ti(shoot) OR ti(shooting) OR ti(shot)) NOT MAINSUBJECT.EXACT.EXPLODE("animals")</p>	
SciELO	<p>((ab:(Programas de transferencia de renda) OR (ab:(Programas de transferência da renda) OR (ab:(ingresos)) OR (ab:(renta)) OR (ab:(sueldo)) OR (ab:(rédito)) OR (ab:(renda)) OR (ab:(rendimento)) OR (ab:(salário)) OR (ab:(proventos)) OR (ab:(ordenado)) OR (ab:(Pagos)) OR (ab:(beneficios)) OR (ab:(dinero)) OR (ab:(Pagamentos)) OR (ab:(dinheiro)) OR (ab:(Apoyo)) OR (ab:(ayuda)) OR (ab:(Apoio)) OR (ab:(Crédito)) OR (ab:(crédito)) OR (ab:(bolsa família)) OR (ab:(bono de desarrollo humano)) OR (ab:(oportunidades)) OR (ab:(progresa)) OR (ab:(prospera)) OR (ab:(juntos)) OR (ab:(Niger delta amnesty)) OR (ab:(pantawid pamilyang)) OR (ab:(pantawid pamilya)) OR (ab:(income supplement)) OR (ab:(income maintenance)) OR (ab:(income benefit)) OR (ab:(income support)) OR (ab:(cash transfer)) OR (ab:(money)) OR (ab:(voucher)) OR (ab:(financial assistance)) OR (ab:(stipend)) OR (ab:(public assistance)) OR (ab:(unemployment benefit)) OR (ab:(unemployment insurance)) OR (ab:(welfare)) OR (ab:(paid family leave)) OR (ab:(paid maternity leave)) OR (ab:(child tax)) OR (ab:(child benefit)) OR (ti:(Programas de transferencia de renda)) OR (ti:(Programas de transferência da renda)) OR (ti:(ingresos)) OR (ti:(renta)) OR (ti:(sueldo)) OR (ti:(rédito)) OR (ti:(renda)) OR (ti:(rendimento)) OR (ti:(salário)) OR (ti:(proventos)) OR (ti:(ordenado)) OR (ti:(Pagos)) OR (ti:(beneficios)) OR (ti:(dinero)) OR (ti:(Pagamentos)) OR (ti:(dinheiro)) OR (ti:(Apoyo)) OR (ti:(ayuda)) OR (ti:(Apoio)) OR (ti:(Crédito)) OR (ti:(crédito)) OR (ti:(bolsa família)) OR (ti:(bono de desarrollo humano)) OR (ti:(oportunidades)) OR (ti:(progresa)) OR (ti:(prospera)) OR (ti:(juntos)) OR (ti:(Niger delta amnesty)) OR (ti:(pantawid pamilyang)) OR (ti:(pantawid pamilya)) OR (ti:(income supplement)) OR (ti:(income maintenance)) OR (ti:(income benefit)) OR (ti:(income support)) OR (ti:(cash transfer)) OR (ti:(money)) OR (ti:(voucher)) OR (ti:(financial assistance)) OR (ti:(stipend)) OR (ti:(public assistance)) OR (ti:(unemployment benefit)) OR (ti:(unemployment insurance)) OR (ti:(welfare)) OR (ti:(paid family leave)) OR (ti:(paid maternity leave)) OR (ti:(child tax)) OR (ti:(child benefit))) AND ((ab:(armas de fuego)) OR (ab:(Armas de fogo)) OR (ab:(Violencia armada)) OR (ab:(Violência armada)) OR (ab:(gun)) OR (ab:(firearm)) OR (ab:(shooting)) OR (ab:(shot)) OR (ab:(gunshot)) OR (ab:(handgun)) OR (ab:(long gun)) OR (ab:(rifle)) OR (ab:(shotgun)) OR (ti:(armas de fuego)) OR (ti:(Armas de fogo)) OR (ti:(Violencia armada)) OR (ti:(Violência armada)) OR (ti:(gun)) OR (ti:(firearm)) OR (ti:(shooting)) OR (ti:(shot)) OR (ti:(gunshot)) OR (ti:(handgun)) OR (ti:(long gun)) OR (ti:(rifle)) OR (ti:(shotgun))) AND ((ab:(Muertos)) OR (ab:(mortalidad)) OR (ab:(fallecido)) OR (ab:(Mortos)) OR (ab:(fatal)) OR (ab:(fatal)) OR (ab:(Crimen)) OR (ab:(delitos)) OR (ab:(crime)) OR (ab:(delito)) OR (ab:(Disparo)) OR (ab:(tiroteo)) OR (ab:(Tiros)) OR (ab:(Tiroteo)) OR (ab:(caça com Arma de fogo)) OR (ab:(crime)) OR (ab:(violence)) OR (ab:(injury)) OR (ab:(victim)) OR (ab:(violencia)) OR (ab:(violência)) OR (ab:(homicide)) OR (ab:(suicide)) OR (ab:(homicidio)) OR (ab:(homicídio)) OR (ab:(suicidio)) OR (ab:(suicídio)) OR (ti:(Muertos)) OR (ti:(mortalidad)) OR (ti:(fallecido)) OR (ti:(Mortos)) OR (ti:(fatal)) OR (ti:(Crimen)) OR (ti:(delitos)) OR (ti:(crime)) OR (ti:(delito)) OR (ti:(Disparo)) OR (ti:(tiroteo)) OR (ti:(Tiros)) OR (ti:(Tiroteo)) OR (ti:(caça com Arma de fogo)) OR (ti:(crime)) OR (ti:(violence)) OR (ti:(injury)) OR (ti:(victim)) OR (ti:(violencia)) OR (ti:(violência)) OR (ti:(homicide)) OR (ti:(suicide)) OR (ti:(homicidio)) OR (ti:(homicídio)) OR (ti:(suicidio)) OR (ti:(suicídio)))</p>	

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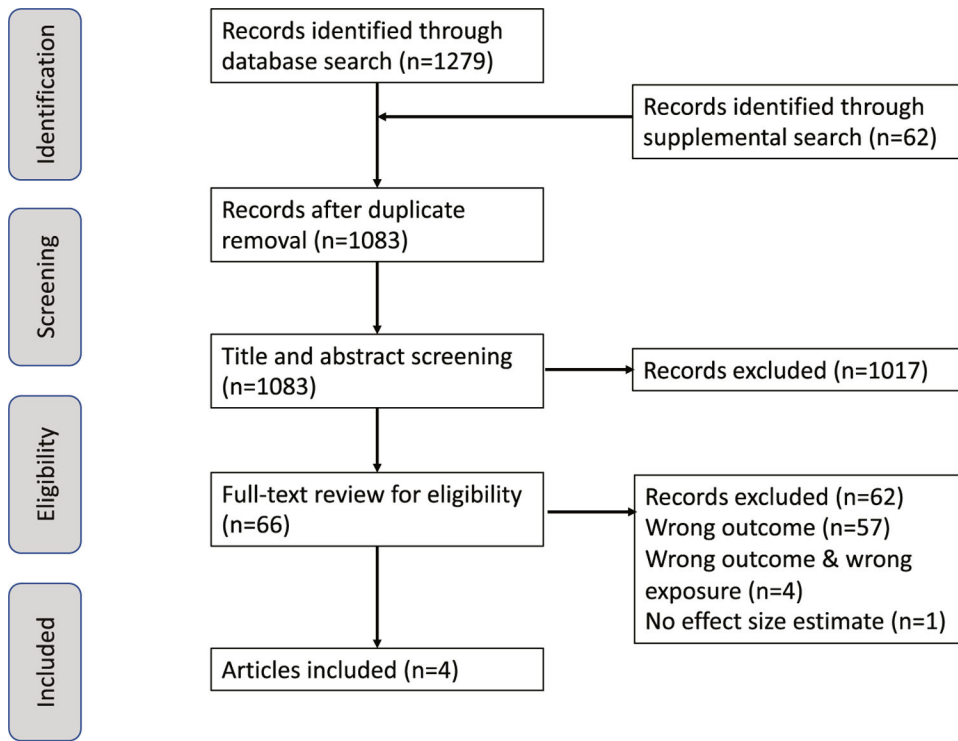


Fig. 1.
Flow Chart of PRISMA Extension for Scoping Reviews.

Table 1

Included studies and their information.

Lead author	Design	Setting	Period	Unit of analysis	Policy or Program	Outcome	Covariates	Analytic strategy	Effect Estimate
Cerdá (Cerdá et al., 2010)	Cross-sectional (ecologic)	New York	1990–1999	Precinct	Public welfare assistance	Firearm homicide	Misdemeanor or ordinance arrest rate, cocaine consumption, firearm availability, alcohol consumption, incarceration rate, complaint rate, felony arrests per complaints, police force, % male, % younger than age 35 y, % black, % Hispanic, % foreign-born, % unemployed, concentrated poverty score, residential stability	Bayesian hierarchical models	For 1 standard deviation increase in % receipt public welfare assistance between time t and t + 1 within precincts: Young adults: PM = -104.20; 95% BCI = -182.0, -26.14 Adults: PM = -28.76; 95% BCI = -52.65, -5.01
Ingram (Ingram and de Costa, 2015)	Cross-sectional (ecologic)	Brazil	2009–2011	Municipality	Bolsa Familia	Firearm homicide	Population size, % rural, population density, % young males, GINI, marginalization, female-headed households in which the woman has no education, works, and has children under age fifteen, adult male employment rate, civil society organizations density, close partnerships with government, environmental impact	Cluster analysis and spatial error, spatial lag, and geographically weighted regressions	Coefficient from ordinary least squares spatial model of the association between Bolsa Familia coverage and firearm homicide rate: -0.002; $p < 0.001$
Kim (Kim, 2019)	Cross-sectional (multi-level)	United States	2015	Census tract	Public welfare spending	Firearm homicide	State level: State fixed effects, education spending, protection spending, and state gun control policy indicators for concealed weapon carry laws, requirements for gun dealers to report records to the state, and state background check laws; community zone level: Median household income, percentage black, racial segregation, income segregation, and an indicator variable for whether the zone corresponded to an urban area; county level: Median household income, percentage black, population density, and property crime rate, and Gini coefficient; census tract level: Median household income, percentage black, with high school education, percentage black, percentage male, percentage males living alone, percentage age 20–34 years, percentage unemployed, % in poverty, total population, % on cash assistance	Negative binomial regression models	For 1 standard deviation increase in state and local public welfare spending lagged by 5 years, IRR = 0.86; 95% CI: 0.83, 0.90
Matthay (Matthay et al., 2019)	Quasi-experimental	California	1996–2016	City	Operation peacemaker fellowship	Inter-personal firearm injury and firearm crime	Poverty, education, income inequality, household composition, housing costs, neighborhood characteristics (e.g., civic engagement), job availability, and unemployment	Synthetic control	55% fewer firearm homicides and hospital visits for firearm assault as well as 43% fewer firearm crimes annually attributable to the program

PM: posterior median; BCI: Bayesian confidence interval; IRR: incidence rate ratio.