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# Early childhood home-based programmes and school violence: evidence from Brazil

Marcos Vinicio Wink Junior, Felipe Garcia Ribeiro and Luis Henrique Zanandrea Paese

**ABSTRACT**

This paper evaluates the impacts of a Brazilian home-based programme on violent behaviour of elementary school students. To identify the causal impact, it explores the variation between schools with potentially treated students and the municipalities that implemented the programme over the years. The results suggest a reduction in verbal or physical abuse, theft or robbery, and attack or threat by more than 5 percentage points in schools with treated students. There is also evidence that the effects are greater the sooner children participate in the programme, meaning that early years interventions can be an effective policy to reduce school violence.

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## Introduction

Brazil is admittedly a violent country. According to data from the Brazilian Public Security Forum, the country registered 65,602 homicides in 2017, a rate of 31.6 per 100,000 inhabitants. This rate is even higher among the young population. In 2017, 35,783 15- to 29-year-olds were murdered in Brazil, representing 69.9 homicides per 100,000 youth.

Recent economic research has emphasised the phenomenon of violence and its impact on economic well-being (Justino, Leone, and Salardi 2014; Minoiu and Shemyakina 2014; Pinotti 2015). One of the primary mechanisms by which violence can affect the development of a society is the fall in the accumulation of human capital. This situation is even more evident when considering the forms of violence within school, which imply higher dropout and failure rates (Grogger 1997), and lower learning indicators, especially for the most vulnerable population (Monteiro and Rocha 2017).

Social and economic factors play an important role in the likelihood of an individual having violent behaviour. Several studies show that vulnerable youth are more likely to commit crimes (Kelly 2000; Fajnzylber, Lederman, and Loayza 2002; Demombynes and Ozler 2005; Hicks and Hicks 2014). Therefore, public policies should focus on the most vulnerable children, as they are at risk of repeated exposure to violence, with possible negative outcomes for their lives in the long term.

Against this backdrop, home-based programmes in early childhood are strategies of focused public policy that have gained strength in recent years. This type of programme consists of visiting parents and children at home during the child's early years. The professionals visiting families are trained to provide information, support, and training on child health, development, and care. While these programmes aim to achieve various goals, emphasis is on children's behavioural problems, such as violent conduct. The literature on the effect of such programmes on children's violent behaviour is still scarce and inconclusive (Piquero et al. 2009; Walker et al. 2011). In general, these studies analyse the effects of interventions in early childhood on violence in adulthood or adolescence, and not on early school years.

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## Study purpose and structure

This paper evaluates the impact of a state-wide home-based programme in early childhood on the violent behaviour of Grade 5 students. The programme, called Better Early Childhood (*Primeira Infância Melhor*, hereafter BEC), has been conducted in the state of Rio Grande do Sul, Southern Brazil, since 2003. Rio Grande do Sul is one of the most populous states in Brazil with approximately 11 million inhabitants. The types of violent behaviour analysed are verbal or physical abuse, attack or threat, robbery or theft, alcohol or drug use, and possession of a weapon or a firearm. We use a difference-in-differences (DID) model for research design, exploring variations between schools with potentially treated students and the municipalities that implemented the programme over the years. In order to validate the results, we also provide a robustness checking procedure that tests whether the municipalities that adopt the programme are systematically different in terms of the dynamics of school violence.

The following sections justify the significance of the study, provide the literature review, describe the BEC, presenting theoretical aspects and the programme's statistics, then the methodology. The final sections discuss the results and present conclusions.

## Study significance

Previous literature suggests that violent behaviour and exposure to violence in childhood and adolescence predict violent behaviour and crime in adulthood (Lambert et al. 2005; Katsiyannis et al. 2013). Also, violent behaviour in childhood has negative consequences on the process of accumulating human capital (Coleman et al. 1966; Grogger 1997; Hurt et al. 2001; McGarvey, Smith, and Walker 2006; Ratner et al. 2006; Figlio 2007; Monteiro and Rocha 2017; Deole 2018). Moreover, there is evidence that these effects are stronger for socially vulnerable children (Jarillo et al. 2016). Thus, by harming school outcomes, especially of socially vulnerable students, violence must also affect society's income mobility (Sharkey and Torrats-Espinosa 2017).

Some mechanisms may explain the negative effects of school violence on student performance. From the student's and teacher's perspectives, violent incidents cause distraction and jeopardise the allocation of time in class. For the family, school violence may influence parents to worry more about school safety instead of the content taught in the classroom (Carroll 2006).

Early childhood development literature has emphasised that proper levels of cognitive and socioemotional skills may reduce risky behaviours, such as violence and crime. Since these skills are developed especially in the first three years of life, early childhood interventions can mitigate the disadvantages of children born in worse family environments (Cunha and Heckman 2007). Thus, early childhood programmes such as BEC can be effective in reducing violent behaviour at all stages of life. To the best of our knowledge, there is no causal estimate in the literature on the effect of home-based programmes on violence in schools, especially in developing countries.

## Literature review

Over recent decades, there has been a significant rise in early childhood programmes and policies around the world. Home-based programmes for parents and children by trained personnel are receiving particular attention. The advantage of this type of intervention is to provide services in a comfortable environment with special attention to family interaction, especially for families in social vulnerability (Azzi-Lessing 2011). By preventing the solidification of problems and behaviours, programmes are more effective the younger the child and the longer the intervention time (Ammerman et al. 2006).

Several studies carried out in different countries have evaluated the effects of home visitation programmes on a variety of short and long-term outcomes (Daro 2006; Olds, Sadler, and Kitzman 2007; Heckman, Pinto, and Savelyev 2013). However, few studies have investigated the relationship

between this type of programme and the violence dimension, especially in low- and middle-income countries. By developing children's cognitive and non-cognitive skills and providing practical instruction on positive-parent child interaction, early childhood home visitation programmes may be effective in reducing violent behaviour (McCoy, Melendez-Torres, and Gardner 2020).

One of the few home visiting programmes in early childhood with consolidated violence assessments in the literature is the Perry Preschool Program. Conducted in 1962 in the American state of Michigan, the programme followed the 123 participants into adulthood. The programme randomly assigned disadvantaged African American children either to the treatment group or a control group. The evidence suggests that there are benefits for the treated group in terms of reducing crime in adulthood (Belfield et al. 2006; Heckman et al. 2010). However, the evidence on the violence dimension is not consistent with other similar American programmes. For example, the Carolina Abecedarian Project (ABC) and Carolina Approach to Responsive Education (CARE) programmes, both conducted in the 1970s in North Carolina, have inconclusive results on crime according to different studies (Clarke and Campbell 1998; Barnett and Masse 2007; Garcia et al. 2016).

Evidence of the impacts of early childhood programmes on crime and violence in other countries is also scarce and inconclusive. For example, the Spanish programme Learning to Live Together at Home does not show a significant reduction in aggressive behaviour for the participating children (Martínez et al. 2019). On the other hand, there is evidence that the Romanian Socio-emotional Prevention Programme is effective in reducing misbehaviour in preschool children (Stefan and Miclea 2013, 2014). Similarly, the stimulation programme for growth-retarded children in Jamaica appears to have reduced violent behaviour in adulthood (Walker et al. 2011).

Therefore, there are no consolidated empirical results on the impact of early childhood programmes on crime and violence in the literature. Evidence may depend on the country, programme design, and age of participants.

## Better early childhood programme

### *Contextual background*

Brazilian legislation was effectively concerned with ensuring the integral development of children only after 1990, with the creation of the Unified Healthcare System (Federal Law 8.080, 1990) that guarantees maternal and child care. During the 1990s, other actions by the Brazilian government consolidated the rights of the integral development of the child, including the Child and Adolescent Statute (Federal Law 8.069, 1990), the Organic Social Assistance Law (Federal Law 8,742, 1993) and the Law of Education Guidelines and Fundamentals (Federal Law 9,394, 1996).

According to Verch (2017), this new national consensus on children's development rights was fundamental to the creation of the BEC programme in Rio Grande do Sul in 2003. Another factor that contributed to the demand for a child care programme was the low proportion of children enrolled in early childhood education in Rio Grande do Sul. For example, in 2006, enrolment rates in day care and pre-school were 9.8% and 55.8% (INEP 2015). These proportions were higher in the country as a whole, at 10% and 78.3%, respectively.

Rio Grande do Sul is the sixth largest of Brazil's 27 states in terms of population (IBGE 2019) with roughly 11.5 million inhabitants. Regarding the population of interest for the present study, Rio Grande do Sul has 13,502 elementary schools with 2,021,490 students enrolled (School Census 2015). The state is the fifth largest by GDP per capita. Although it is higher than the Brazilian GDP per capita (IBGE 2015), this alone does not account for the reduction of inequality, as observed by the Gini Index, 0.476, which places the state as the seventh-most equal state in the country (IPEA 2014). Moreover, this higher average income, when compared to Brazilian standards, seems contradictory when we look at yearly homicidal rates (rate per 100,000), placing the state of Rio Grande do Sul in eighth place according to the Violence Atlas (IPEA 2017).

Home-based early intervention programmes have become increasingly common in developing countries with high social inequality. These programmes have been used to address various issues related to opportunities inequalities, public health, education, and violence for both visited children and their parents. The theoretical assumption around these policies is that early childhood interventions are critical to a child's full development. It is at this stage of life that receiving appropriate stimuli is most likely to transform a child's future, especially in the most vulnerable strata of society (Cunha and Heckman 2007).

## *Programme design and coverage*

The BEC programme consists of weekly home visits by trained professionals to families in socially vulnerable situations. Families and children are guided through specific play activities aimed at both the full development of children's cognitive and socio-emotional skills and the enhancement of parents' skills to educate their children. The programme's services are offered in two ways. The first is through individualised care, performed within the family's home, aimed at pregnant women and children up to 3 years old. The second form of service consists of activities in community spaces, providing collective care of children between 4 and 5 years old.

The two forms of assistance offered by the programme consist of recreational activities that strengthen family and community relationships. They also contribute to the full development of children's physical, intellectual, social, and emotional capacities. Although the programme is not created exclusively to combat violence, guidance is provided on the rights and responsibilities of family and community life.

The BEC was the first Brazilian home-based programme aimed at early childhood.[1] By 2018, 15 years after its creation, BEC had already served more than 200,000 children in about 80,000 families in Rio Grande do Sul. Although BEC is developed at the state level, the municipalities are responsible for the operation. They form a working group under the coordination of the State Secretary of Health. Thus, the implementation of the BEC is more related to the willingness of the city to offer the programme than to the social conditions of the city. Figure 1 shows the evolution of the number of municipalities qualified to implement the programme. Since its creation in 2003 until

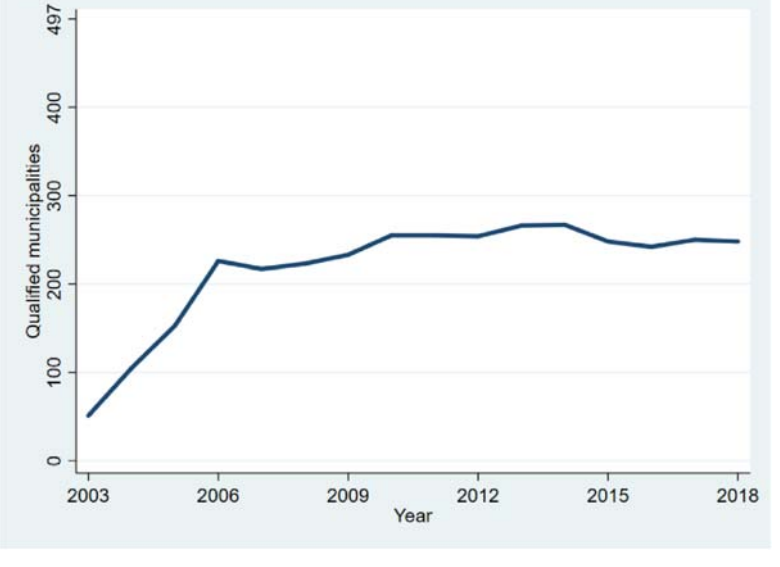


**Figure 1.** Implementation of Better Early Childhood Programme in Rio Grande do Sul, 2003–2018.
Source: Elaborated by the authors based on data from the State Secretary of Health of Rio Grande do Sul.

**Table 1.** Evolution of the BEC participants, 2003–2018.

| Year | Number of families | Number of children | Number of pregnant women | Number of professionals carrying out visits |
|---|---|---|---|---|
| 2003 | 1875 | 2063 | 225 | 75 |
| 2004 | 7850 | 8635 | 942 | 314 |
| 2005 | 20225 | 22248 | 2427 | 809 |
| 2006 | 40125 | 44138 | 4815 | 1605 |
| 2007 | 37100 | 40810 | 4452 | 1484 |
| 2008 | 46525 | 51178 | 5583 | 1861 |
| 2009 | 54100 | 59510 | 6492 | 2164 |
| 2010 | 58550 | 64405 | 7026 | 2342 |
| 2011 | 59550 | 65505 | 7146 | 2382 |
| 2012 | 47640 | 52404 | 7146 | 2382 |
| 2013 | 54320 | 59752 | 8148 | 2716 |
| 2014 | 55140 | 60654 | 8271 | 2757 |
| 2015 | 52220 | 57442 | 7833 | 2611 |
| 2016 | 51700 | 56870 | 7755 | 2585 |
| 2017 | 54020 | 59422 | 8103 | 2701 |
| 2018 | 53980 | 59378 | 8097 | 2699 |

Source: Elaborated by the authors based on data from the State Secretary of Health of Rio Grande do Sul.

2018, the number of municipalities in the programme increased from 51 to 248, representing 50% of the municipalities of Rio Grande do Sul.

Table 1 shows the evolution of the programme since 2003, and the increase in the number of beneficiaries as more municipalities qualify to participate. In 2018, the BEC benefited more than 59,000 children in Rio Grande do Sul, representing about 7% of the population up to 5 years old.[2] There is also a considerable increase in the number of pregnant women served by the programme. The increase in the numbers related to the services provided is a result of the higher number of professionals hired to carry out visits.

## Methodology

### *Data*

We use microdata from *Prova Brasil* as the primary source of data.[3] This exam is a biennial census tests of students in Grades 5 and 9 of elementary school, attending public schools that have at least 20 students enrolled (in the year of the exam). *Prova Brasil* is used to measure students' knowledge of Portuguese and maths through standardised exams and to collect socio-economic information from students, teachers, and school principals. We collected information from 2013 and 2015 of Grade 5 students of elementary schools in Rio Grande do Sul. The sample we used consists of 4,936 elementary schools in 2013 and 4,378 in 2015. Since only some schools participate in *Prova Brasil*, the sample corresponds to approximately one third of all schools in Rio Grande do Sul.

The dependent variables are the occurrence of violent behaviour in schools. These data are collected in the *Prova Brasil* questionnaire answered by teachers. Table 2 presents the types of inappropriate conduct considered in this study, as well as their occurrences in Rio Grande do Sul schools. Verbal or physical abuse is the most common type of violence observed. For 2015, in 85.9% of the schools, at least one Grade 5 teacher reported having witnessed or been a victim of such violence by a student. Also noteworthy is the high incidence of other inappropriate student behaviours. Although the study does not focus on the country as a whole, the statistics in Table 2 referring to Rio Grande do Sul are similar to those of Brazil overall.

The identification of students potentially treated by BEC programme is obtained from the schools' socio-economic level. The Brazilian Ministry of Education calculates this variable in order to contextualise the results of schools in the Brazil's national evaluation of basic education. The indicator of socio-economic level uses information from the questionnaires of the *Prova Brasil* that indicate the background of students, such as possession of household assets and parents' education.

**Table 2.** Proportion of elementary schools that had occurrences of violent behaviour of 5th-grade students in the elementary schools, Rio Grande do Sul, 2013 and 2015.

| Forms of aggressive behaviour | 2013 | 2015 |
|---|---|---|
| Verbal or physical abuse | 87.9% | 85.9% |
| Attack or threat | 17.2% | 16.5% |
| Robbery or theft | 10.8% | 10.6% |
| Alcohol or drug use | 18.1% | 20.1% |
| Possession of a weapon or a firearm | 10.3% | 10.4% |
| Schools in the sample | 4,936 | 4,378 |

Note: Information about the occurrence of violent behaviour collected from responses provided by teachers in public schools of Rio Grande do Sul during the *Prova Brasil*.
Source: Elaborated by the authors based on data from *Prova Brasil*.

**Table 3.** Proportion of schools per socio-economic level in Rio Grande do Sul, 2013 and 2015.

| | All municipalities | | Participating municipalities | | Non-participating municipalities | |
|---|---|---|---|---|---|---|
| Socio-economic level | 2013 | 2015 | 2013 | 2015 | 2013 | 2015 |
| Very low | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Low | 0.04% | 0.00% | 0.00% | 0.00% | 0.12% | 0.00% |
| Medium low | 1.90% | 0.14% | 1.77% | 0.07% | 2.15% | 0.30% |
| Medium | 29.50% | 10.90% | 30.88% | 11.10% | 26.91% | 10.42% |
| Medium high | 60.70% | 56.65% | 58.97% | 56.94% | 63.92% | 55.99% |
| High | 7.86% | 31.73% | 8.37% | 31.30% | 6.90% | 32.69% |
| Very high | 0.00% | 0.06% | 0.00% | 0.59% | 0.00% | 0.60% |
| Schools in the sample | 4,936 | 4,378 | 3,212 | 3,035 | 1,724 | 1,343 |

Source: Elaborated by the authors based on data from *Prova Brasil*.

After calculating the socio-economic indicator, schools were classified into seven levels. Table 3 presents the proportion of schools in each socio-economic level for Rio Grande do Sul. It shows that no schools were classified as very low or very high in any of the years analysed. This is not surprising, since Rio Grande do Sul is neither among the richest states nor among the poorest in Brazil. Also, there seems to be no difference in the proportions of schools at each socio-economic level between municipalities participating and not participating in the programme.

## *Empirical strategy*

The main challenge to estimate the programme's impact on occurrences of school violence is to deal with selection bias. Children eligible for the programme may have observed and unobserved characteristics that also determine their violent behaviour.

The empirical strategy aimed to isolate the effect of BEC on the occurrence of violent or inappropriate behaviour of Grade 5 students. Specifically, we use a DID research design which explores variations between potentially treated students and the municipalities that implemented the programme (Khandker, Koolwal, and Samad 2010). We estimate the following equation:

$$Y_{i,m} = \beta_0 + \beta_1 BEC_m + \beta_2 PotTreated_i + \beta_3 BEC_m \times PotTreated_i + \delta' X_{i,m} + u_{i,m} \quad (1)$$

where $Y_{i,m}$ is a set of dummy variables that indicate whether at least one teacher in school $i$, located in a municipality $m$, reported any type of violent behaviour by students. The types of occurrences analysed are verbal or physical abuse, attack or threat, robbery or theft, alcohol or drug use, and possession of a weapon or a firearm. $BEC_m$ is a dummy that assumes value 1 if the municipality in which the school is located provide the programme in the year considered. $PotTreated_i$ represents schools with students that potentially participated in the programme. This group includes schools with socio-economic levels that are low, medium low, and medium. The vector $X_{i,m}$ is the set of control variables used, related to school characteristics (the average score obtained by students in the

**Table 4.** Average marginal effect of the BEC on the probability of occurrence of violent behaviour in schools, Rio Grande do Sul, 2015.

| Year of entering the BEC | 2004/2005/2006/2007<br>Treated up to 3 years of age | 2008/2009/2010<br>Treated after 3 years of age |
|---|---|---|
| Verbal or physical abuse | −0.0590** | −0.0511** |
| | (0.0263) | (0.0259) |
| Attack or threat | −0.104*** | −0.101** |
| | (0.0397) | (0.0392) |
| Robbery or theft | −0.0522** | −0.0542** |
| | (0.0261) | (0.0255) |
| Alcohol or drugs use | −0.0392 | −0.0291 |
| | (0.0426) | (0.0427) |
| Possession of a weapon or a firearm | −0.0254 | −0.0173 |
| | (0.0317) | (0.0310) |
| Observations | 3,880 | 4,203 |

Notes: *significant at 10%; **significant at 5%; ***significant at 1%. Marginal effects of Probit presented in the table. Robust standard errors with municipal clusters are in brackets. Regressions are weighed by school size. Dependent variable: dummy indicating whether a teacher reported violent behaviour in school. All regressions include control of schools (average score in Portuguese and maths, location, and administrative unit), and control of teachers (if holding a degree and if having a second job/activity). The control group used in all regressions is formed by municipalities that were not part of the programme by 2010.

Source: Data from *Prova Brasil* 2015, from Grade 5 students of elementary public schools of the state of Rio Grande do Sul.

standardised exams on Portuguese and maths; location and unit of administration) and teacher (salary and if the teacher has a second job). Lastly, $u_{i,m}$ represents the error term of the regression.

Equation 1 is estimated by Probit. The method is applied considering the hypothesis that a latent variable determines the dependent variable with a normal distribution. Puhani (2012) demonstrates that the estimation of DID models are valid to estimate non-linear models such as Probit. The coefficient of interest to be estimated is $\beta_3$. It captures the causal effect of BEC on the likelihood of violent behaviour occurring in schools. The hypothesis of identification is that, in the absence of the programme, the difference between occurrences in potentially treated schools and control groups would be the same in municipalities with or without the programme.

Grade 5 elementary school students in Brazil must be between 10 and 11 years old. In our sample, 80% of students are in this age group. Thus, considering 2015, the cohort of interest must have been born between 2004 and 2005. The schools with students considered treated in 2015, therefore, are those with lower socio-economic levels, located in municipalities that had implemented the BEC between 2004 and 2010 (i.e. the students were between 0 and 5 years old in that period). The control group is made up of schools from municipalities that did not participate in the BEC until 2010. It is important to highlight that *Prova Brasil* does not offer information on which students actually participated in the BEC programme. Therefore, the estimated effect concerns the potential participants of the programme, observing the socio-economic level of the school. As BEC programme is oriented to serve the most disadvantage children, we raise the assumption that BEC programme participants must be enrolled in lower socio-economic level schools.

We also estimate regressions using data from *Prova Brasil* 2013. This option allows building a "placebo" that would be schools located in municipalities that entered the BEC between 2009 and 2010 since the cohort of students of interest would already be more than 5 years old on these dates and therefore could not be directly benefited by the programme.

## Results

This section introduces the results of the estimation of the DID method, performed according to equation 1. The marginal effects resulting from the Probit model are shown for different specifications seeking to explore the different years the municipalities started the programme.

Table 4 presents the results for 2015. The first column identifies the regression's dependent variable. Estimates in the second column consider as potentially treated only schools located in municipalities that entered in the BEC programme between 2004 and 2007. In this case, the affected cohort would have received treatment up to 3 years of age. The programme considers this age group as a priority and professionals visit families in their homes. The results in the third column consider as potentially treated, the schools in municipalities that started the BEC programme between 2008 and 2010. In this case, the students would be over 3 years of age at the implementation of the programme, which would mean they could have participated in the programme's collective care services instead of the home-based.

The estimated marginal effects, which can also be interpreted as average treatment effects, are all negative, indicating that the implementation of the BEC programme implies a reduction in the likelihood that any teacher of a school potentially treated will report a form of violent behaviour. Results were statistically significant for verbal or physical abuse, attack or threat, and robbery or theft. In the case of attack or threat, for the younger potentially treated group, the effect was significant at 1%.

The magnitude of estimations was slightly higher, in general, for the first period of municipalities entering in the BEC programme. Although it was already expected that intervention in early childhood would be more effective, the programme has been refined over time and this factor may have contributed even more to the result found. Our estimates suggest that the implementation of the BEC programme, observing the hypothesis of identification, reduces the likelihood of verbal or physical abuse in the potentially treated school by more than 5 percentage points. A similar effect was found for robbery or theft. In the case of attack or threat, this magnitude is over 10 percentage points.

These results can be explained by the type of care provided by the BEC. The programme is characterised by tackling children's emotional issues as well as assisting parents in raising them. These characteristics are fundamental to the development of young people and their future behaviour. It is noteworthy that all estimates refer to subjects potentially treated, which suggests that the effect on the population effectively treated should be higher.

Table 5 presents the second alternative of estimation, which considered the information from *Prova Brasil* 2013. As in Table 4, two sets of regressions were prepared, in addition to the placebo test. The first group was formed with municipalities that entered in the BEC programme between 2003 and 2005. In this case, the children, up to 3 years old, benefited by the programme, did the

**Table 5.** Average marginal effect of the BEC on the probability of occurrence of violent behaviour in schools, Rio Grande do Sul, 2013.

| Year of entering the BEC | 2003/2004/2005<br>Treated up to 3 years of age | 2006/2007/208<br>Treated after 3 years of age | 2009/2010<br>Placebo |
|---|---|---|---|
| Verbal or physical abuse | −0.0345 | 0,0342* | 0.0386** |
| | (0.0218) | (0.0198) | (0.0195) |
| Attack or threat | −0.0461 | −0.0397 | −0.0414 |
| | (0.0371) | (0.0356) | (0.0351) |
| Robbery or theft | −0.0121 | −0.0045 | 0.00677 |
| | (0.0266) | (0.0259) | (0.0255) |
| Alcohol or drugs use | −0.0519 | −0.0279 | −0.0291 |
| | (0.0375) | (0.0368) | (0.0357) |
| Possession of a weapon or a firearm | −0.0539** | −0.0349 | −0.0293 |
| | (0.0268) | (0.0274) | (0.0277) |
| Observations | 3,514 | 4,216 | 4,382 |

Notes: *significant at 10%; **significant at 5%; ***significant at 1%. Marginal effects of Probit presented in the table. Robust standard errors with municipal clusters are in brackets. Regressions are weighed by school size. Dependent variable: dummy indicating whether a teacher reported violent behaviour in school. All regressions include control of schools (average score in the exams of Portuguese and maths, location, and administrative unit), and control of teachers (if holding a degree and if having a second job/activity). The control group used in all regressions is formed by municipalities that were not part of the programme by 2010.

Source: Data from Prova Brasil 2013, from Grade 5 students of elementary public schools of Brazilian state of Rio Grande do Sul.

exam *Prova Brasil* in 2013. The second group of analysis was formed by the municipalities that implemented the programme between 2006 and 2008. The benefited children would be over 3 years old. Finally, the last column of Table 5 shows the result of a placebo exercise. The Grade 5 students who participated in *Prova Brasil* 2013 were more than 5 years old in 2009 and 2010. Thus, although the municipality offered the programme, the cohort was not affected and therefore, for these schools, the BEC programme should not have had an impact on the occurrence of violence.

Results for the 2013 data do not show a consistent pattern of the marginal effect signal, indicating that the BEC did not reduce the occurrence of violent behaviour in schools. The only significant estimate at 5% is the effect of the programme on reducing possession of weapons in school. An explanation for this result, discussed before, is that the programme was still under development in its early years, and it advanced over time regarding both scope and training of professionals. There is already evidence in the literature of improvement of social programmes over the years (Rocha and Soares 2010).

The placebo test presented in the last column of Table 5 also did not present significant estimates, except for the specification for verbal or physical abuse. This result suggests that there are no unobserved variables that are related either to the occurrence of violence or to the municipalities participating in the programme.

## Conclusion

School violence can have several negative impacts on society. According to the literature, the two main ways this type of violence impacts society are by reducing children's schooling and increasing chances of criminal behaviour in the future. From this perspective, this study sought to evaluate the impact of a programme of home-based in early childhood on the violent behaviour of Grade 5 students, carried out in the Brazilian state in Rio Grande do Sul.

The types of occurrences analysed were verbal or physical abuse, attack or threat, robbery or theft, alcohol or drug use, and possession of a weapon or a firearm. Teachers report this information in the questionnaire responded to during the *Prova Brasil* assessment, conducted every two years nationwide. The identification strategy explored variations between schools with students potentially treated and municipalities that implemented the programme.

Our results suggest that the implementation of the programme in the municipalities of Rio Grande do Sul reduced violent behaviour in schools, especially in the occurrence of verbal or physical abuse, attack or threat, and robbery or theft. The effects are pronounced when the child receives the intervention in early childhood, especially when the programme has been established for a longer time in the municipality. The estimated effects are up to 5 percentage points of reduction in occurrences of verbal or physical abuse and robbery or theft, and 10 percentage points in the cases of attacks or threats.

This type of study, especially for developing countries, can help underpin long-term public security policies and contribute to the evaluation of the BEC programme. According to the empirical literature, reducing school violence is negatively associated with future crime and positively associated with the accumulation of human capital. The evidence found here is attributed, however, to the potentially treated population (identified based on the socio-economic level of the schools). The effects of the programme on subjects effectively treated can be even more significant.

## Notes

1. BEC was formalised in State Law 12.544, enacted on 3 July 2006.
2. The population in this age group is comprised of 849,000 children, according to the State Secretary of Planning of the Rio Grande do Sul.
3. The assessment is conducted by the National Institute for Educational Studies and Research Anísio Teixeira (Inep), institution related to the Brazilian Ministry of Education.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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