




## RESEARCH ARTICLE

# The impact of the COVID-19 pandemic on gender-based violence and physical violence among women in Peru [version 1; peer review: awaiting peer review]

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**V1** First published: 08 Aug 2022, 6:102  
<https://doi.org/10.12688/gatesopenres.13749.1>  
Latest published: 08 Aug 2022, 6:102  
<https://doi.org/10.12688/gatesopenres.13749.1>

## Abstract

**Background:** Gender-based violence (GBV) is an increasing social problem worldwide, but it has been neglected despite its high relevance to women's health. In this study, we aim to assess the coronavirus disease 2019 (COVID-19) pandemic impact on GBV incidence in Peruvian, determine the physical violence prevalence and its associated factors among GBV victims.

**Methods:** We assessed the impact of the COVID-19 pandemic on the GBV weekly incidence by fitting an autoregressive integrated moving average model. Additionally, we assessed the physical violence prevalence and its associated factors by fitting a multivariate Poisson regression model with a link log and robust variance.

**Results:** We analyzed 588,587 cases of women victims of GBV and calculated an annual GBV incidence of 518, 714, 958, 596, and 846 cases per 100,000 women during the years 2017-2021, respectively. During the COVID-19 pandemic, the observed GBV weekly incidence went significantly below the forecasted GBV weekly incidence since 2021. Overall, most GBV cases were of middle to high-risk (76%), regular (75%), and verbal (82%) violence. Most victims were single (81%), rural (75%), mothers with children (60%), who did not complete high school (54%). Most aggressors were men (81%), paid workers (77%), had completed high school education (63%), and partner of their victims (58%). Around 44% of the victims suffered physical violence and its main associated factors were aggressor's school education (adjusted prevalence ratio = 0.89; 95% confidence interval: 0.88-0.89), aggressor's age <40 years old (1.30; 1.29-1.30), aggressor's paid job (0.99; 0.98-0.99), prior violence report (1.27; 1.26-1.27), victim's age <40 years old (1.23; 1.22-1.24), and victim non-Peruvian citizenship (1.04; 1.01-1.07).

## Open Peer Review

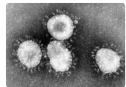
**Approval Status** Awaiting Peer Review

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**Conclusions:** GBV is endemic in Peru, but the COVID-19 pandemic reduced its burden significantly in 2020-2021. Several characteristics of the cases, victims, and aggressors have changed over time, offering new opportunities for implementing interventions to address this social problem.

## Keywords

Violence, Gender-Based Violence, Intimate Partner Violence, Domestic Violence, Physical Abuse, Risk Factors



This article is included in the [Coronavirus \(COVID-19\)](#) collection.

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**Competing interests:** No competing interests were disclosed.

**Grant information:** The author(s) declared that no grants were involved in supporting this work.

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**How to cite this article:** Quispe A, Vargas L, Sotelo M *et al.* **The impact of the COVID-19 pandemic on gender-based violence and physical violence among women in Peru [version 1; peer review: awaiting peer review]** Gates Open Research 2022, 6:102 <https://doi.org/10.12688/gatesopenres.13749.1>

**First published:** 08 Aug 2022, 6:102 <https://doi.org/10.12688/gatesopenres.13749.1>

## Introduction

Gender-based violence (GBV) is a public health, social policy, and human rights concern<sup>1</sup>. Globally, over one out of three women experience physical or sexual violence in their lifetime, usually perpetrated by their intimate partner<sup>2</sup>. At the beginning of the coronavirus disease 2019 (COVID-19) pandemic, most countries implemented lockdowns as an initial response. This measure immediately raised alerts about the increase in GBV cases and decreased health service access for GBV victims<sup>3-5</sup>. Contradictory, GBV research remained underfunded, and GBV provisions became scarce with increased GBV inequities for underserved groups<sup>6</sup>.

GBV is a broad term encompassing different violence forms that share a common gender-based characteristic. Hence, GBV includes different general forms of violence such as domestic violence and intimate partner violence but also specific forms of violence such as verbal violence, physical violence, sexual violence, psychological abuse, and economic violence<sup>7</sup>. Regardless of which form of GBV you explore, the lockdowns and social distance imposed during the COVID-19 pandemic have had as an unintended consequence the exacerbation of GBV<sup>8</sup>. Furthermore, the risk of death or physical harm intensified under pandemic conditions because of the generated dependency and proximity to their aggressors. In contrast, health care, GBV provisions, and escape routes got limited, leading some survivors to contemplate self-harm<sup>9</sup>. In some low-middle income countries, GBV skyrocketed during the lockdowns and curfews compared to the pre-pandemic years<sup>10-12</sup>.

Before the COVID-19 pandemic, GBV was already endemic in Peru, with around three out of every five Peruvian women reporting being exposed to some form of GBV, including psychological abuse (53%) and physical violence (30%), and sexual abuse (7%)<sup>13</sup>. However, fewer than one-third of GBV victims seek help at any public institution after being physically assaulted<sup>14</sup>. Consequently, in a country with high social tolerance (59%) towards gender-based violence<sup>15</sup>, there was a genuine concern about the negative effect of the COVID-19 pandemic. In this study, we aim to assess the COVID-19 pandemic impact on GBV incidence and the changes in the characteristics of the GBV cases, victims, and aggressors. Additionally, we performed a cross-sectional analysis to assess the physical violence-associated factors among the GBV victims.

## Methods

### Ethics

We use exclusively open data for the study, downloading it from Peruvian government public domains. This data before its publication is masked and clear from any individual identifier. The study did not involve risks to people's health and integrity, so the Peruvian Institute of Legal Medicine IRB approved the study protocol under IRB exemption regulation.

### Study design and population

We conducted a cross-sectional study to assess the impact of the COVID-19 pandemic on the weekly incidence of GBV among women residents in Peru and evaluated the associated

factors of physical violence. First, we contrasted the trend of the weekly incidence of GBV cases reported in Peru during 2017–2021 against the weekly mortality from all causes. And second, we analyze the associated factors of physical violence among the women victims of GBV by contrasting the criminological characteristics of the cases, as well as the features of the victims and their aggressors, between the victims versus not victims of physical violence. To perform both analyses, we evaluated the open data from the surveillance system of GBV in Peru during 2017–2021.

### Study outcome

In our first analysis, we used the weekly incidence rate of GBV as the study outcome. Hence, at the national and regional levels, we calculated the weekly incidence rate of GBV by multiplying the accumulated cases per epidemiological week by 100,000 women and dividing the product by the estimated annual women population. Likewise, we calculated the weekly mortality rate by multiplying the accumulated death counts per epidemiological week by 100,000 and dividing the product by the estimated annual population. In our second analysis, we modeled the prevalence of physical violence among the women victims of GBV and assessed its associate factor. We define as positive to physical violence every GBV case where the victim reported having been hurt by kicking, hitting, slapping, hair pulling, grabbing, pushing, beating, lashing, hanging, asphyxia/strangling, wounded by any weapon or object, rape, or hurt by any other form of physical violence (scratching, biting, headbutting, etc.). In this analysis, we assessed as potential associated factors the criminological characteristics of the GBV cases and the characteristics of the victims and the aggressors.

### Data sources

We obtained the GBV data, death counts, population estimates, and region's geographical boundaries using open data curated from the Peruvian government. First, we got GBV from the [Peruvian Ministry of Women and Vulnerable Populations](#)<sup>16</sup>. Second, we obtained the women population estimates from the Peruvian [National Institute of Statistics and Informatics](#)<sup>17</sup>. Third, We got the death counts from all causes from the Peruvian [National System of Deaths \(SINADEF\)](#)<sup>18</sup>. And four, we obtained the Peru regional boundaries for our maps from the [Peruvian Ministry of the Environment](#)<sup>19</sup>.

### Statistical analysis

We performed a descriptive analysis to characterize the GBV cases, victims, and aggressors, as well as its variability before (2017–2019) and during the COVID-19 pandemic (2020–2021). Then, we performed a graphical analysis of the weekly incidence of GBV cases and the weekly mortality rates at the national by using the “ggplot2” package<sup>20</sup>. After, we forecasted the 2017–2019 data to assess the hypothetical scenario without the pandemic effect by fitting an autoregressive integrated moving average (ARIMA) model<sup>21</sup>. As part of the forecasting modeling, we tested whether the time series was not stationary using the Phillips-Perron test and for white noise using the Portmanteau test. After completing the model parametrization,

we selected an ARIMA (4,1,1) as the most suitable model for our GBV data using Akaike's Information Criterion (AIC). Complementary, we assessed the regional distribution of GBV by mapping the annual incidence of GBV cases during the years 2017–2021 using the QGIS program 3.22. Finally, we fit a Poisson regression model with a link log and robust variance to assess the associated physical violence factors using the prevalence ratio as a measure of interest. For the regression analysis, we used the packages “Epi,” “foreign,” “sandwich,” “lmtest,” and the procedures described by Espelt *et al.*<sup>22</sup> We evaluated as a potentially associated factor the criminological characteristics of the GBV cases and the characteristics of the victims and the aggressors as potential associated factors. The criminological features of the GBV cases included: regular violence (defined as daily, weekly or monthly violence), rural origin (versus urban area), victim direct report, aggressor's violence report, femicide attempt, physical violence (including kicking, hitting, slapping, hair pulling, grabbing, pushing, beating, lashing, hanging, asphyxia/strangling, wounded by any weapon or object, rape, or hurt by any other form of physical violence), verbal violence (including screaming/yelling, devaluating/humiliating, rejecting, swearing, harassment, other forms of verbal violence and threats of death, harm, eviction or suicide), sexual violence (sexual assault, touching/indecent assault, sexual harassment, sexual exploitation, threats or intimidation to perform sexual acts and other forms of sexual violence such as forcing prostitution, pornography, etc.), and economic violence including refusing/evading obligation to provide food support, basic needs, financial aid, possession's subtraction, destruction or appropriation, or any other for or economic violence such as salary control, reduction, or limitation. We used R 3.6.1 (R Foundation for Statistical Computing, Vienna, Austria) and R Studio 1.2.5001 (Free Software Foundation, Inc., Boston, MA) for the statistical analysis and the QGIS program 3.22 to elaborate the maps with the clustering analysis results.

## Results

### Gender-based violence at the national level

We analyzed 588,587 cases of women victims of GBV, reported by 450 reporting units across Peru. The annual average count of GBV cases reported by these centers was 276 (standard deviation [SD] =301; range: 4 to 3227) in 2017, 329 (S.D. =327; range: 4 to 2934) in 2018, 384 (SD =337; range: 5 to 2598) in 2019, 237 (SD =202; range: 1 to 1822) in 2020, and 328 (SD =242; range: 7 to 1778) in 2021. Based on these reports, we calculated an annual incidence of GBV of 518 cases per 100,000 women in 2017, 714 cases per 100,000 women in 2018, 958 cases per 100,000 women in 2019, 596 cases per 100,000 women in 2020, and 846 cases per 100,000 women in 2021. Compared to 2019, the latest pre-pandemic year, Peru recorded a reduction in its annual incidence of GBV of 37.7% in 2020 and 10.7% in 2021.

### Gender-based violence at the regional level

At the regional level, the Peruvian regions that reported an annual incidence of GBV of over 1000 cases per 100,000 women increased from 1/25 in 2017 to 7/25 in 2018, and 14/25 in

2019. However, the count of these regions decreased to 6/25 in 2020 and rose again to 14/25 in 2021 (Figure 1). Overall, the regions with the highest annual incidence of GBV in Peru were Tumbes, Apurímac, Arequipa, Ayacucho, Cusco, and Tacna, all of which exceeded over 1000 cases per 100,000 women during 2019–2021. Conversely, Peru's regions with the lowest annual incidence of GBV were Ucayali and Cajamarca, with an annual incidence of GBV below 500 per 100,000 women consistently from 2017 to 2021 (Table 1).

### Gender-based violence weekly incidence trend before and during the COVID-19 pandemic

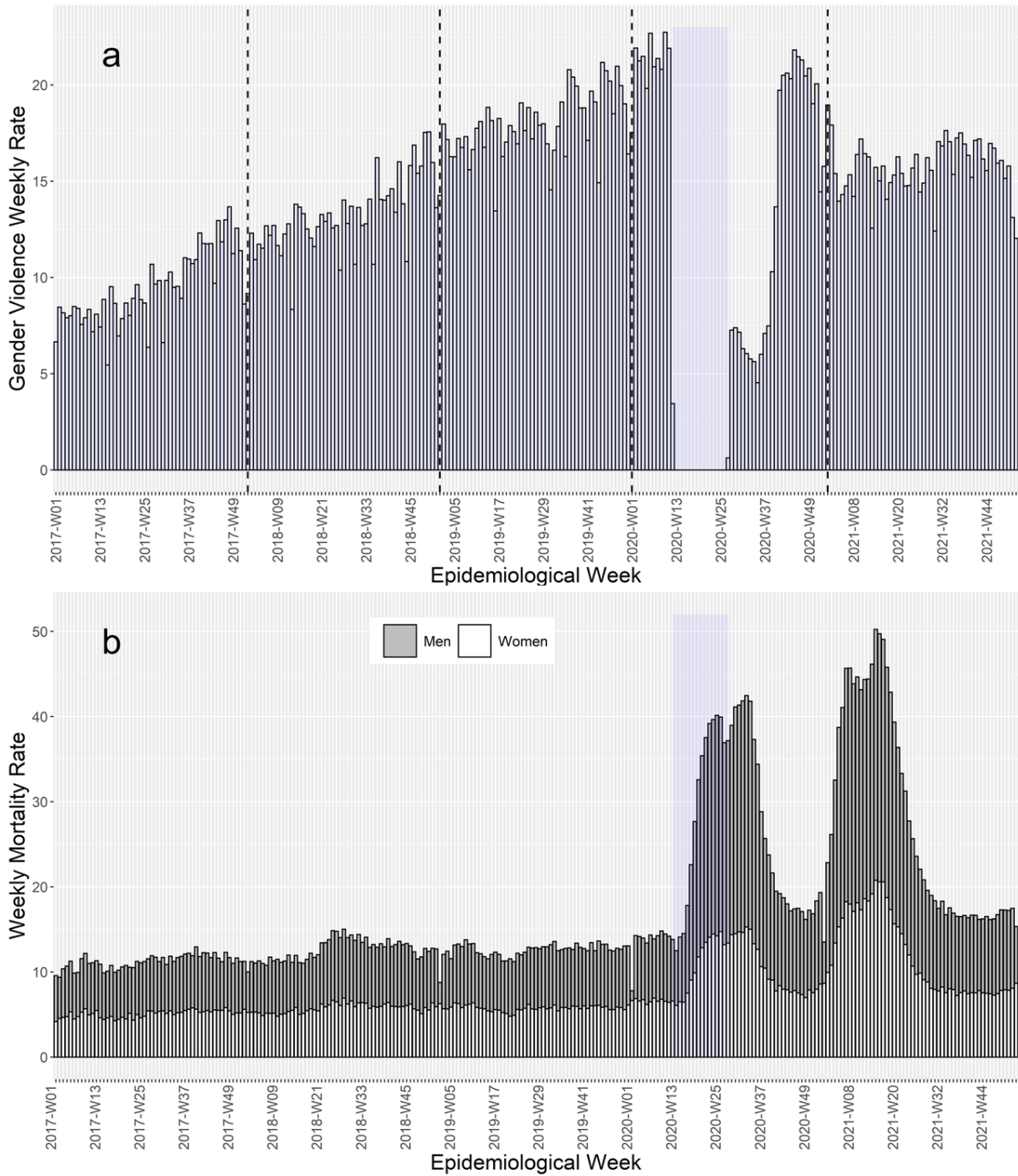
From the first epidemiological week in 2017 to the 52nd epidemiological week in 2019, the GBV weekly incidence in Peru increased by around 0.06 GBV cases per 100,000 women per week (95% confidence interval [95% CI]: 0.02 to 0.10 GBV cases per 100,000 women) (Figure 2A). The increasing trend continued in 2020, reaching a peak of 22.7 GBV cases per 100,000 women per week in the epidemiological week 10–2021. However, the COVID-19 pandemic significantly impacted the registry of GBV once Peru implemented a national lockdown at the epidemiological week 12 in 2020. The lockdown ended at the epidemiological week 27–2020, three weeks after reaching the peak of Peru's first wave of the COVID-19 pandemic (Figure 2B). Since then, the reporting units began to operate progressively until they became fully operative in the epidemiological week 42 in 2020. In 2020, the GBV weekly incidence peaked at the epidemiological 46 with 20.5 cases per 100,000 women. And in 2021, the GBV weekly incidence started a plateau after the second epidemiological week.

### Impact of the COVID-19 pandemic on the gender-based violence weekly incidence

Our time series analysis observed a non-stationary positive trend in the weekly incidence during 2017–2019. We projected this trend to the years 2021–2022 to assess the impact of the COVID-19 pandemic by fitting an ARIMA (4,1,1) (Figure 3). This model turned to be the most suitable model for our GBV data compared to the ARIMA (2,1,1) ARIMA (3,1,1) ARIMA (2,2,1), ARIMA (2,3,1), and ARIMA (2,4,1) models. Besides the total collapse of the reporting system during the lockdown, we observed that only for six weeks (from the epidemiological weeks 42–49) the observed GBV weekly incidence was within the forecasted 95% confidence interval. Hence, we observed that during the COVID-19 pandemic, there was a significant reduction of the observed GBV weekly incidence, which seems to plateau since the epidemiological week 03 of 2021.

### Criminological characteristics of the gender-based violence in Peru

GBV cases are highly variable regarding their criminological characteristics (Table 2). According to the Risk of Death or Physical Integrity Peruvian score, most women victims of GBV were at the middle (50%) or high risk (21%). Most GBV cases reported regular violence (75%) and verbal violence (82%). Around 44% of victims also suffered physical violence, 11% sexual violence, 7% economic violence, and 0.3% a femicide attempt. During 2017–2021, the annual prevalence of



**Figure 1. Regional incidence of gender-based violence in Peru during 2017-2021.** Legend: The figure shows the evolution of the regional gender-based violence annual rates (cumulative cases counts per year/100,000 Peruvian women) in Peru during the years 2017 (Figure 2A), 2018 (Figure 2B), 2019 (Figure 2C), 2020 (Figure 2D), and 2021 (Figure 2E).

**Table 1. Regional Incidence of GBV cases reported in Peru, 2017–2021.**

Region	Total GBV Cases per Year					Annual GBV Incidence				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
Apurímac	1453	2132	3465	2535	3442	699.4	1020.5	1650.7	1205.0	1637.5
Tumbes	783	1912	1924	1629	1921	720.0	1719.1	1693.1	1406.2	1630.6
Arequipa	7896	10554	13162	9044	12302	1110.5	1448.6	1764.8	1187.3	1585.1
Moquegua	544	823	1156	764	1338	632.9	942.5	1303.8	850.0	1470.8
Ayacucho	2702	3335	5054	3563	4692	842.7	1032.7	1555.2	1092.1	1436.3
Cusco	6373	7912	10741	6995	9617	990.3	1211.0	1620.7	1043.2	1421.4
San Martín	2667	3089	4690	3425	6095	667.4	756.0	1123.8	805.5	1410.8
Huánuco	2068	2863	4249	2520	5021	554.2	764.3	1130.8	670.4	1338.9
Madre de Dios	601	715	972	694	1004	895.9	1022.5	1335.1	918.0	1282.4
Tacna	1319	2298	2823	1837	2339	767.3	1308.1	1573.8	1004.8	1257.7
Ancash	3298	4900	7725	4294	6939	580.3	852.4	1329.7	733.0	1177.7
Pasco	860	1106	1755	1009	1478	653.6	839.2	1330.7	766.4	1128.0
Ica	2090	3940	5331	3061	5227	466.2	854.1	1124.2	629.4	1050.4
Huancavelica	1268	1423	1822	1125	1798	667.3	760.0	988.0	620.9	1012.8
Junín	4345	6029	7809	4020	6596	654.9	898.8	1152.4	588.6	960.7
Amazonas	1076	1226	1638	1424	1588	534.2	602.3	796.9	687.9	764.0
Ucayali	718	859	931	746	2149	276.7	321.7	339.2	265.0	746.0
Puno	3390	4256	5379	3542	4566	543.0	680.0	857.9	565.5	731.9
Lima	23427	35909	47768	27138	37119	453.5	679.5	884.4	492.6	662.1
Piura	2638	3860	6210	4356	6713	272.9	392.2	620.1	428.3	651.3
La Libertad	3364	4159	6669	4915	6539	351.4	425.2	667.9	483.4	633.2
Lambayeque	1335	2150	3719	2785	3789	208.2	329.6	560.8	414.1	556.9
Callao	2063	2732	3458	2247	2970	381.2	492.8	609.3	387.5	502.4
Loreto	1986	2387	3283	1796	2356	417.6	494.0	669.4	361.7	469.9
Cajamarca	2745	3158	3359	2462	3235	384.6	439.3	464.2	338.9	444.8

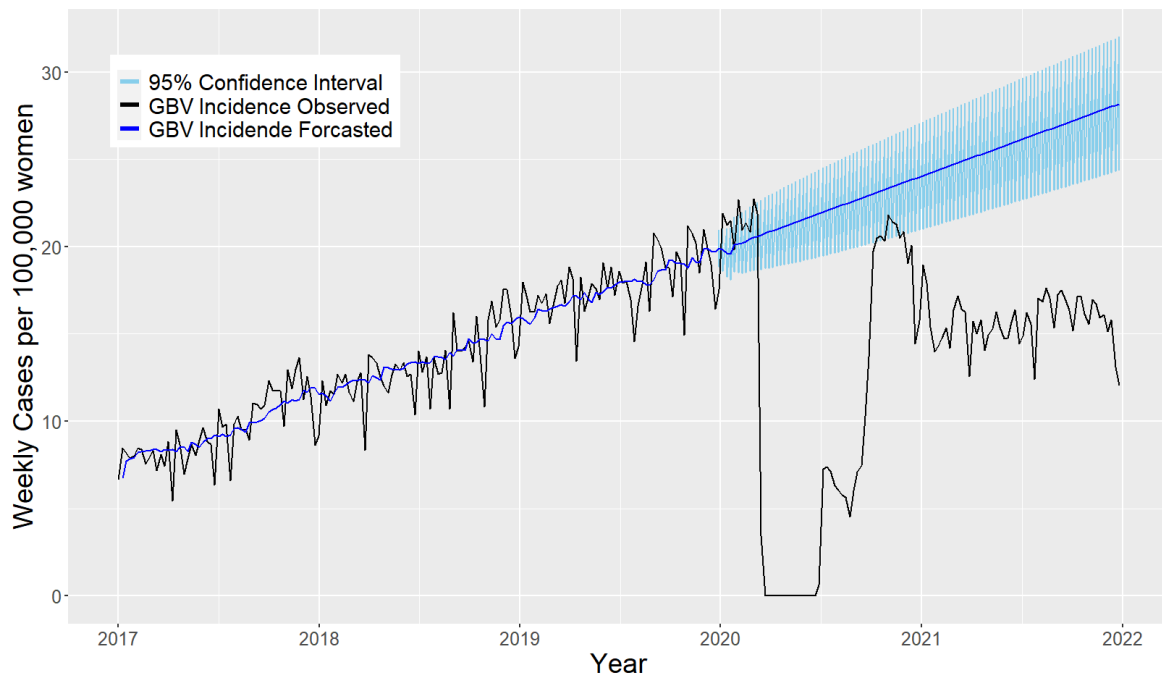
**Legend:** Annual gender-based violence (GBV) incidence is expressed as the total GBV cases counted per 100,000 women.

high-risk violence (15.9% in 2017 to 23.8% in 2021) and violence regularity (69.0% in 2017 to 80.4% in 2021) increased significantly ( $p < 0.05$ ). On the contrary, the annual prevalence of verbal violence (from 84.0% in 2017 to 78.5% in 2021) and economic violence (from 7.2% in 2017 to 5.2% in 2021) decreased significantly ( $p < 0.05$ ).

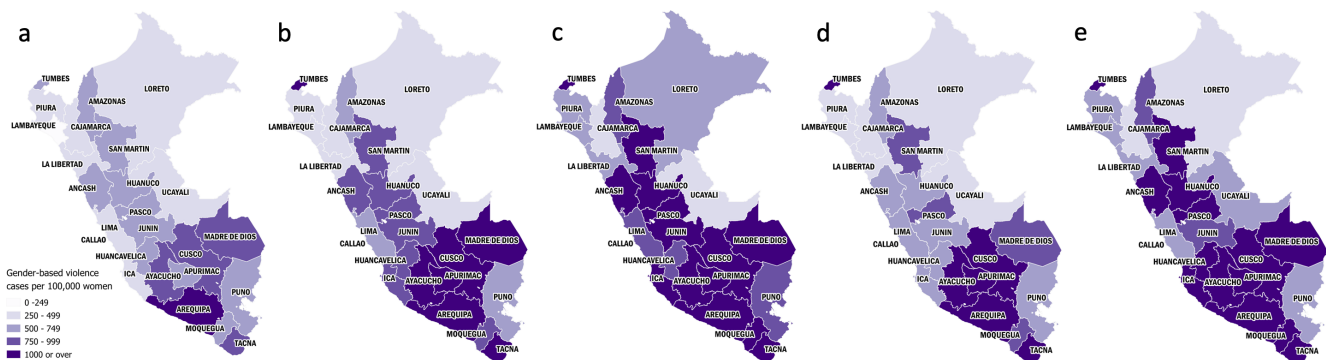
#### Characteristics of women victims of gender-based violence in Peru

The profile of the GBV victims also varied significantly during the COVID-19 pandemic (Table 3). The GBV victims'

age in Peru ranged from 1 to 104 years old, with a mean age of 30.6 years ( $SD = 16.5$ ). Most victims were single (81%), from rural areas (75%), did not complete high school (54%), and have children (60%), with a median number of children of one (Interquartile range [IQR] = 3; range: 0 to 18). Around 3% of the victims were pregnant, and 1% were born outside Peru. In addition, most victims have a history of GBV previously reported (71%). Across the years 2017–2021, we observed a significant ( $p < 0.05$ ) increase in the GBV annual prevalence among victims with non-Peruvian citizenship (0.3% in 2017 to 1.6% in 2021), single status (79.4% in 2017 to 82.9% in



**Figure 2. Weekly incidence rates of gender-based violence and weekly mortality rates from all causes in Peru during 2017–2021.** Legend: The figure shows the evolution of the national GBV weekly rates (cumulative cases counts per week /100,000 Peruvian women) in Peru during the years 2017–2021 (Figure 2A) contrasted with the weekly mortality deaths (death counts per week /100,000 inhabitants of Peru) during the COVID-19 pandemic in Peru (Figure 2B). Also, it shows the national quarantine period (blue shadow), which stops the cases reported from epidemiological weeks 10–26.



**Figure 3. Forecasted versus the observed incidence of gender-based violence in Peru during 2017–2021.** Legend: The figure shows the national GBV (Gender-Based Violence) weekly incidence (cumulative cases counts per week /100,000 Peruvian women) in Peru as observed during the years 2017–2021 (Dashed line) contrasted 2020–2021 forecasted GBV weekly incidence (Figure 1B). The 2020–2021 GBV weekly incidence was forecasted using an ARIMA model using the 2017–2019 GBV weekly incidence.

2021), and history of previous GBV reports (59.1% in 2017 to 76.8% in 2021). On the contrary, we observed a significant ( $p < 0.05$ ) decrease in the annual GBV prevalence among women from urban areas (from 82.1% in 2017 to 49.2% in 2021).

### Characteristics of the gender-based violence’ aggressors

Like the GBV victims, the profile of the GBV aggressors also varied significantly during the COVID-19 pandemic (Table 4).

The age of the GBV aggressors in Peru is highly variable (range: 4 to 98 years old), with a mean age of 38.3 years old (SD = 12.1). Most aggressors were men (81%) with complete high school education (63%), a paid job (77%), and a partner history with their victims (58%). Around 45% of these aggressors cohabit with their victims, 33% have a family bond, 27% use enablers (alcohol or drugs), and 0.9% were born outside Peru. Across the years 2017–2021, we observed a significant ( $p < 0.05$ ) increase in the annual GBV prevalence

**Table 2. Criminological characteristics of the GBV cases reported in Peru, 2017–2021.**

Violence Characteristics	Total n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)
Death/integrity risk score						
Low risk	168,560 (28.6)	27,173 (33.5)	37,644 (33.1)	45,974 (29.6)	24,082 (24.6)	33,687 (23.9)
Middle risk	296,675 (50.4)	40,979 (50.6)	55,398 (48.7)	76,801 (49.5)	49,932 (51.0)	73,565 (52.2)
High risk	123,352 (21.0)	12,857 (15.9)	20,685 (18.2)	32,317 (20.8)	23,912 (24.4)	33,581 (23.8)
Regular violence	439,128 (74.6)	55,889 (69.0)	79,683 (70.1)	114,377 (73.8)	75,899 (77.5)	113,280 (80.4)
Femicide attempt	1,581 (0.3)	250 (0.3)	304 (0.3)	404 (0.3)	330 (0.3)	293 (0.2)
Physical violence	257,626 (43.8)	36,740 (45.4)	52,265 (46.0)	65,633 (42.3)	41,316 (42.2)	61,672 (43.8)
Including pushing/punching	91,717 (15.6)	11,897 (14.7)	17,192 (15.1)	24,516 (15.8)	15,633 (16.0)	22,479 (16.0)
Including hair pulling	64,983 (11.0)	9,242 (11.4)	13,232 (11.6)	17,397 (11.2)	10,123 (10.3)	14,989 (10.6)
Including slapping	59,276 (10.1)	8,184 (10.1)	11,887 (10.5)	16,430 (10.6)	9,324 (9.5)	13,451 (9.6)
Including kicking	55,597 (9.5)	8,757 (10.8)	11,506 (10.1)	14,399 (9.3)	8,525 (8.7)	12,410 (8.8)
Including asphyxia/hanging	19,787 (3.4)	2,245 (2.8)	4,018 (3.5)	5,504 (3.6)	3,333 (3.4)	4,687 (3.3)
Verbal violence	479,930 (81.5)	68,059 (84.0)	94,998 (83.5)	127,904 (82.5)	78,374 (80.0)	110,595 (78.5)
Including screaming/yelling	436,001 (74.1)	61,657 (76.1)	86,553 (76.1)	115,708 (74.6)	70,991 (72.5)	101,092 (71.8)
Including devaluation/humiliation	281,701 (47.9)	38,868 (48.0)	56,039 (49.3)	74,723 (48.2)	46,526 (47.5)	65,545 (46.5)
Including death threat	74,859 (12.7)	9,987 (12.3)	16,033 (14.1)	20,529 (13.2)	11,979 (12.2)	16,331 (11.6)
Including verbal rejection	62,840 (10.7)	5,849 (7.2)	11,570 (10.2)	18,623 (12.0)	10,491 (10.7)	16,307 (11.6)
Including eviction threat	59,672 (10.1)	9,155 (11.3)	12,458 (11.0)	15,313 (9.9)	9,496 (9.7)	13,250 (9.4)
Sexual violence	63,649 (10.8)	8,419 (10.4)	11,044 (9.7)	15,600 (10.1)	12,147 (12.4)	16,439 (11.7)
Including rape/sexual assault	33,193 (5.6)	4,269 (5.3)	5,724 (5.0)	7,448 (4.8)	5,985 (6.1)	9,767 (6.9)
Including touching/indecent assault	23,282 (4.0)	3,067 (3.8)	4,362 (3.8)	6,167 (4.0)	4,958 (5.1)	4,728 (3.4)
Economic violence	42,567 (7.2)	5,848 (7.2)	10,605 (9.3)	12,398 (8.0)	6,402 (6.5)	7,314 (5.2)
Including refusing/evading the obligation to provide food support	17,100 (2.9)	2,176 (2.7)	5,145 (4.5)	4,819 (3.1)	2,346 (2.4)	2,614 (1.9)
Including refusing/evading the obligation to provide financial support	15,262 (2.6)	2,666 (3.3)	2,759 (2.4)	4,683 (3.0)	2,425 (2.5)	2,729 (1.9)

**Legend:** GBV, gender-based violence

**Table 3. Characteristics of the female GBV victims in Peru, 2017–2021.**

GBV Victims' Characteristics	Total n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)
Age, years, mean ± SD	30.6 ± 16.7	30.7 ± 16.5	30.7 ± 16.4	30.6 ± 16.3	30.7 ± 16.7	30.5 ± 16.7
0–19 years old	161,858 (27.5)	22,297 (27.5)	30,719 (27.0)	41,229 (26.6)	27,078 (27.7)	40,535 (28.8)
20–29 years old	135,207 (23.0)	17,668 (21.8)	25,782 (22.7)	37,295 (24.1)	22,571 (23.1)	31,891 (22.6)
30–39 years old	134,107 (22.8)	18,859 (23.3)	26,814 (23.6)	35,815 (23.1)	21,938 (22.4)	30,681 (21.8)
≥40 years old	157,415 (26.7)	22,185 (27.4)	30,412 (26.7)	40,753 (26.3)	26,339 (26.9)	37,726 (26.8)



GBV Victims' Characteristics	Total n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)
Urban origin	443,252 (75.3)	66,505 (82.1)	95,480 (84.0)	131,205 (84.6)	80,796 (82.5)	69,266 (49.2)
Foreign	6,560 (1.1)	260 (0.3)	763 (0.7)	1,886 (1.2)	1,402 (1.4)	2,249 (1.6)
Pregnant	16,835 (2.9)	2,297 (2.8)	3,318 (2.9)	4,409 (2.8)	2,745 (2.8)	4,066 (2.9)
Children, count, median $\pm$ IQR	1 $\pm$ 3	2 $\pm$ 3	1 $\pm$ 3	1 $\pm$ 3	1 $\pm$ 3	0 $\pm$ 1
Single civil status	476,962 (81.0)	64,279 (79.4)	90,685 (79.7)	125,410 (80.9)	79,865 (81.6)	116,723 (82.9)
Education						
None	27,781 (4.7)	4,313 (5.3)	5,234 (4.6)	7,054 (4.6)	4,725 (4.8)	6,455 (4.6)
Pre-school	116,323 (19.8)	17,902 (22.1)	22,962 (20.2)	30,343 (19.6)	18,643 (19.0)	26,473 (18.8)
Primary school	174,689 (29.7)	24,404 (30.1)	33,988 (29.9)	44,821 (28.9)	28,982 (29.6)	42,494 (30.2)
Secondary school	128,567 (21.8)	16,624 (20.5)	24,225 (21.3)	34,336 (22.1)	22,043 (22.5)	31,339 (22.3)
Superior	141,227 (24.0)	17,766 (21.9)	27,318 (24.0)	38,538 (24.9)	23,533 (24.0)	34,072 (24.2)
Paid job	217,863 (37.0)	28,524 (35.2)	42,931 (37.8)	60,432 (39.0)	35,424 (36.2)	50,552 (35.9)
Prior violence report	416,280 (70.7)	47,867 (59.1)	74,713 (65.7)	110,119 (71.0)	75,381 (77.0)	108,200 (76.8)

**Legend:** GBV, gender-based violence; SD, standard deviation; IQR, interquartile range.

**Table 4. Characteristics of the aggressors in the GBV cases reported in Peru, 2017–2021.**

GBV Aggressors' Characteristics	Total n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)
Age, years, mean $\pm$ SD	38.3 $\pm$ 12.1	38.6 $\pm$ 11.8	38.2 $\pm$ 11.9	38.1 $\pm$ 12.0	38.3 $\pm$ 12.2	38.4 $\pm$ 12.2
0–19 years old	17,260 (2.9)	2,048 (2.5)	3,095 (2.7)	4,568 (3.0)	3,088 (3.2)	4,461 (3.2)
20–29 years old	130,560 (22.2)	16,695 (20.6)	24,895 (21.9)	35,539 (22.9)	22,041 (22.5)	31,390 (22.3)
30–39 years old	193,453 (32.9)	27,380 (33.8)	38,285 (33.7)	50,884 (32.8)	31,648 (32.3)	45,256 (32.1)
$\geq$ 40 years old	247,314 (42.0)	34,886 (43.1)	47,452 (41.7)	64,101 (41.3)	41,149 (42.0)	59,726 (42.4)
Men	530,294 (90.1)	72,324 (89.3)	102,281 (89.9)	140,364 (90.5)	88,457 (90.3)	126,868 (90.1)
Foreign	5,204 (0.9)	197 (0.2)	612 (0.5)	1,491 (1.0)	1,079 (1.1)	1,825 (1.3)
Education						
None	10,256 (1.7)	1,503 (1.9)	1,784 (1.6)	2,681 (1.7)	1,855 (1.9)	2,433 (1.7)
Pre-school	47,052 (8.0)	7,934 (9.8)	9,362 (8.2)	11,939 (7.7)	7,426 (7.6)	10,391 (7.4)
Primary school	155,129 (26.4)	22,296 (27.5)	30,184 (26.5)	40,634 (26.2)	25,501 (26.0)	36,514 (25.9)
Secondary school	241,441 (41.0)	30,382 (37.5)	45,434 (40.0)	63,287 (40.8)	41,605 (42.5)	60,733 (43.1)
Superior	134,709 (22.9)	18,894 (23.3)	26,963 (23.7)	36,551 (23.6)	21,539 (22.0)	30,762 (21.8)
Paid job	446,979 (77.1)	62,799 (78.5)	88,354 (78.7)	118,539 (77.2)	72,690 (75.8)	104,597 (75.7)
Enablers	156,077 (26.5)	19,603 (24.2)	30,442 (26.8)	41,366 (26.7)	26,324 (26.9)	38,342 (27.2)
Family bond	196,237 (33.3)	27,955 (34.5)	38,142 (33.5)	48,788 (31.5)	33,180 (33.9)	48,172 (34.2)
Partner history	342,287 (58.2)	47,452 (58.6)	67,016 (58.9)	93,065 (60.0)	55,765 (57.0)	78,989 (56.1)
Cohabitant	265,876 (45.2)	35,690 (44.1)	49,643 (43.7)	67,669 (43.6)	40,769 (41.6)	72,105 (51.2)

**Legend:** GBV, gender-based violence; SD, standard deviation.

among foreign aggressors (0.2% in 2017 to 1.3% in 2021), enablers users (24.2% in 2017 to 27.2% in 2021), and those who cohabit with their victims (44.1% in 2017 to 51.2% in 2021). On the contrary, we observed a significant ( $p < 0.05$ ) decrease in the annual prevalence of GBV among aggressors with paid jobs (from 78.5% in 2017 to 75.7% in 2021).

**Physical violence associated factors among women victims' gender-based violence**

In our bivariate analysis, we observed that several characteristics of the GBV cases, victims, and aggressors might be associated

with physical violence (Table 5). The list included the following: aggressor's school education, aggressor's age <40 years old, the aggressor's paid job, prior violence report, victim's <40 years old, foreigner victim, victim's single status, aggressor family bond, aggressor partner bond, number of children, aggressor enablers intake, help-seeking, urban area, aggressor's men, economic violence, year, verbal violence, victim's paid job, foreign aggressor, and victim's school education. However, in our multivariate linear regression analysis that the main physical violence associated factors among women victim GBV were: aggressor's school education (adjusted prevalence

**Table 5. Physical violence associated factors among the GBV victims in Peru, 2017-2021.**

Physical Violence Associated factors	Total n (%)	Physical violence		p-value
		Positive n (%)	Negative n (%)	
Aggressor's school education	376,150 (63.9)	216,994 (65.6)	159,156 (61.8)	<0.001*
Aggressor's <40 years old	335,863 (57.1)	168,965 (51.1)	166,898 (64.8)	<0.001*
Aggressor's paid job	446,979 (77.1)	252,745 (77.4)	194,234 (76.7)	<0.001*
Prior violence report	416,280 (70.7)	222,805 (67.3)	193,475 (75.1)	<0.001*
Victim's <40 years old	431,172 (73.3)	227,641 (68.8)	203,531 (79.0)	<0.001*
Foreigner victim	6,560 (1.1)	3,182 (1.0)	3,378 (1.3)	<0.001*
Victim's single status	476,962 (81.0)	259,187 (78.3)	217,775 (84.5)	<0.001*
Aggressor family bond	196,237 (33.3)	119,043 (36.0)	77,194 (30.0)	<0.001*
Aggressor partner bond	342,287 (58.2)	185,249 (56.0)	157,038 (61.0)	<0.001*
Children, Median ± IQR	1 ± 3	1 ± 2	1 ± 3	<0.001*
Aggressor enablers intake	156,077 (26.5)	82,735 (25.0)	73,342 (28.5)	<0.001*
Help-seeking	238,697 (40.6)	139,510 (42.2)	99,187 (38.5)	<0.001*
Urban area	443,252 (75.3)	253,856 (76.7)	189,396 (73.5)	<0.001*
Aggressor's men	530,294 (90.1)	301,289 (91.0)	229,005 (88.9)	<0.001*
Economic violence	42,567 (7.2)	26,394 (8.0)	16,173 (6.3)	<0.001*
Year				
2017	81,009 (13.8)	44,269 (13.4)	36,740 (14.3)	<0.001*
2018	113,727 (19.3)	61,462 (18.6)	52,265 (20.3)	
2019	155,092 (26.4)	89,459 (27.0)	65,633 (25.5)	
2020	97,926 (16.6)	56,610 (17.1)	41,316 (16.0)	
2021	140,833 (23.9)	79,161 (23.9)	61,672 (23.9)	
Verbal violence	479,930 (81.5)	273,151 (82.5)	206,779 (80.3)	<0.001*
Victim's paid job	217,863 (37.0)	125,578 (37.9)	92,285 (35.8)	<0.001*
Foreign aggressor	5,204 (0.9)	2,658 (0.8)	2,546 (1.0)	<0.001*
Victim's school education	269,794 (45.8)	153,727 (46.5)	116,067 (45.1)	<0.001*

**Legend:** GBV, gender-based violence; IQR, interquartile range; \* p value <0.05.

ratio [aPR] = 0.89; 95% CI: 0.88 to 0.89), aggressor's <40 years old (aPR = 1.30; 95% CI: 1.29-1.30), aggressor's paid job (aPR = 0.99; 95% CI: 0.98-0.99), prior violence report (aPR = 1.27; 95% CI: 1.26-1.27), victim's <40 years old (aPR = 1.23; 95% CI: 1.22-1.24), foreigner victim (aPR = 1.04; 95% CI: 1.01-1.07) (Table 6).

## Discussion

In the last five years, Peru registered over a half million GBV cases, reaching the highest annual incidence in 2019 with 958 GBV cases per 100,000 women. Since the COVID-19 pandemic hit Peru, we observed a significant decrease in the

incidence of GBV across Peru. Compared to 2019, the latest pre-pandemic year, Peru recorded a reduction in its annual incidence of GBV of 37.7% in 2020 and 10.7% in 2021. Despite this reduction, Peru sustained a high GBV incidence with over 846 GBV cases per 100,000 women in 2021. Furthermore, at the regional level, in 2021, the count of regions with GBV incidence over 1000 per 100,000 women rose again to the exact count observed in 2019 (14/25), soon after decreased substantially in 2020 (6/25). More specifically, before the COVID-19 pandemic, Peru experienced a significant and sustained increment in its GBV weekly incidence since 2017 until reaching a peak of 22.7 GBV cases per 100,000 women per

**Table 6. Regression analysis of physical violence among GBV victims in Peru, 2017–2021.**

Factors associated	PR (95% CI)	p-value	aPR (95%CI)	p-value
Aggressor's school education	0.91 (0.91 – 0.92)	<0.001*	0.89 (0.88 – 0.89)	<0.001*
Aggressor's <40 years old	1.38 (1.38 – 1.39)	<0.001*	1.30 (1.29 – 1.30)	<0.001*
Aggressor's paid job	0.98 (0.97 – 0.98)	<0.001*	0.99 (0.98 – 0.99)	<0.001*
Prior violence report	1.25 (1.24 – 1.26)	<0.001*	1.27 (1.26 – 1.27)	<0.001*
Victim's <40 years old	1.37 (1.36 – 1.38)	<0.001*	1.23 (1.22 – 1.24)	<0.001*
Foreigner victim	1.17 (1.15 – 1.21)	<0.001*	1.04 (1.01 – 1.07)	<0.001*
Victim's single status	1.27 (1.27 – 1.29)	<0.001*	---	---
Aggressor family bond	0.86 (0.85 – 0.86)	<0.001*	---	---
Aggressor partner bond	1.12 (1.12 – 1.13)	<0.001*	---	---
Number of children	0.97 (0.97 – 0.98)	<0.001*	---	---
Aggressor enablers intake	1.10 (1.10 – 1.11)	<0.001*	---	---
Help-seeking	0.92 (0.91 – 0.92)	<0.001*	---	---
Urban area	0.91 (0.90 – 0.92)	<0.001*	---	---
Aggressor's men	0.88 (0.87 – 0.89)	<0.001*	---	---
Economic violence	0.86 (0.85 – 0.87)	<0.001*	---	---
Year				
2017	Reference			
2018	1.01 (1.00 – 1.02)	0.008*	---	---
2019	0.93 (0.92 – 0.94)	<0.001*	---	---
2020	0.93 (0.92 – 0.94)	<0.001*	---	---
2021	0.97 (0.96 – 0.97)	<0.001*	---	---
Verbal violence	0.92 (0.91 – 0.93)	<0.001*	---	---
Victim's paid job	0.95 (0.94 – 0.96)	<0.001*	---	---
Foreign victim	1.12 (1.09 – 1.15)	<0.001*	---	---
Victim's school education	0.97 (0.96 – 0.97)	<0.001*	---	---

**Legend:** GBV, gender-based violence; PR, prevalence ratio; aPR, adjusted prevalence ratio; CI, confidence interval; \*, p-value <0.05

week in the epidemiological week 10 of 2021. However, as soon as the pandemic started, countries entered a national lockdown, shutting down GBV registries, which will recover gradually upon countries reopening their economic activities since the epidemiological week 27 of 2020. After, Peru never registered GBV weekly incidences as high as the ones observed in the weeks before the COVID-19 pandemic, starting a plateau in the epidemiological week 2 of 2021.

Globally, GBV and its forms spiked dramatically during the COVID-19 pandemic, to the point that global leaders labeled it as a “shadow pandemic,” “pandemic within a pandemic,”<sup>23</sup> or more accurately as a perfect syndemic<sup>24</sup>. Regardless, most countries entered national lockdowns and practically abandoned GBV victims to their luck by shutting down their most needed medical care, psychosocial support or counseling, access to shelters, and legal provisions<sup>25</sup>. Before the COVID-19 pandemic, Peru was already experiencing an increasing burden of GBV, with nearly 1000 GBV cases per 100,000 women per year. In our study, we observed that upon entering the national lockdown due to the COVID-19 pandemic, the Peruvian government shut down the GBV surveillance system, the shelters, and legal services for over four months. Soon after, the United Nations Population Fund warned that national lockdowns severely disrupted the access to sexual and reproductive health services and hampered the ability of authorities to respond to gender-based violence<sup>26</sup>. In response to the increasing GBV reports, In April 2020, the Peruvian government published the legislative decree 1140, which partially amended this situation, reopening most of these services online and implementing the mobile response teams (Itinerant Emergency Teams)<sup>27</sup>. Additionally, upon the recommendation of the Social Scientist Task Force to address the increasing GBV incidence, the Peruvian government habilitated two large shelters for over 1000 GBV victims<sup>28</sup>. Regardless, when using the annual GBV incidence from 2019 as the baseline, we observed that Peru recorded a reduction of 37.7% in 2020 and 10.7% in 2021. However, Peru sustained a high annual GBV incidence with over 846 GBV cases per 100,000 women in 2021. Furthermore, our time series analysis confirmed that the COVID-19 pandemic significantly impacts the GBV weekly incidence, reducing its burden in 2020 and shifting its trend from increasing to a plateau that started on the second epidemiological week of 2021.

The profile of the GBV cases varied largely across countries, but in Latin America, it seems that physical violence has a high prevalence that ranges from 16% to 41%<sup>29</sup>. Furthermore, previous reports evidenced that the mortality associated with GBV appears to be very high in Latina American countries contrasted with the rest of the countries worldwide<sup>30</sup>. Such is the case of Peru, which before the pandemic shifted their femicides incidence from decreasing<sup>31,32</sup> to increasing<sup>33</sup>, reaching its higher femicides incidence in 2019 with a yearly incidence of 1.01 femicides per 100,000 women. In our study, we observed that during 2017–2021 the GBV cases became more violent, increasing the annual prevalence of high-risk violence from 16% to 24% and the violence regularity from 69% to 80%. On the contrary, we observed that during the same period, the

annual prevalence of verbal and economic violence decreased significantly, from 84% to 79% and from 7% to 5%, respectively.

The GBV risk factors include younger age, being unmarried, having lower education, personal and family history of GBV during childhood, having an intimate relationship with a partner who abuses alcohol/drugs, victims’ unemployment, and having a history of being a GBV aggressor<sup>34</sup>. Furthermore, the GBV risk factors at the macro level include gender inequality, social spending, lack of police action after a GBV complaint, gender access inequity to education, and poor criminalization practice regarding GBV<sup>35</sup>. Understanding the impact of GBV risk factors at the macro level is essential to further understanding the COVID-19 pandemic impact on GBV incidence. It is particularly critical to understand further how the lockdowns and isolation increased the GBV risk and the barriers for the GBV victims to seek help and report their situation, independently of the individual risk factors<sup>36</sup>. In our study, we observed that most victims were single, from rural areas, did not complete high school and were mothers with children. On the other side, most aggressors were men with paid jobs, finished high school education, and had a partner history with their victims.

GBV varies widely across urban and rural areas, particularly in low-middle-income countries. In Eastern Africa, for example, the risks of experiencing intimate partner violence were significantly higher among women who resided in rural areas (RR = 1.13; CI 1.07–1.22) than those who lived in urban areas<sup>37</sup>. Previous studies reported that over their life, 45% of Peruvian women experience some form of GBV, with rates as high as 69% in rural areas<sup>38</sup>. Cities do not generate GBV, but they certainly offer more opportunities for reducing it than those provided in rural areas<sup>39</sup>. In Peruvian rural areas, family values play a crucial role in the decision for women to continue abusive relationships based on the belief that the needs of the family take precedence over the needs of the individual<sup>38</sup>. Other factors that may help to understand the relationship between rural origin and GBV are the economic and educational factors, which are proven with the direct association between illiteracy and poverty with GBV in rural communities in Peru<sup>38</sup>. In our study, we observed that most victims were women from rural areas and that the GBV incidence was consistently higher among the regions in the highlands of Peru. This difference is because the highland areas are not only more rural than the regions from the coast and the jungle but also higher in poverty and women without secondary education than the rest of the country’s women.

Gender-based physical violence, which includes beating, burning, kicking, punching, biting, maiming, killing, or using objects or weapons, often escalates from milder forms of violence, including verbal and economic violence. Therefore, to prevent physical violence and ulterior femicides attempts is essential to study its risk factors, which seem to vary by country. For example, in African countries, the physical violence risk factors include having multiple intimate partners, income gap within couple households, and negative attitudes about sexual violence

(for example, the belief that having non-consensual sex is not rape)<sup>40</sup>. In the United States, the risk factors for men perpetrating physical aggression against their partners included parental violence, dating before age 14, intermittent explosive disorder before and after age 20, dating aggression, and being victimized by the partner<sup>41</sup>. In India, the physical violence risk factors include husbands regularly consuming alcohol, dowry harassment (which is the attempt to obtain more money or goods from a wife's family after the marriage), personal history of harsh physical punishment during childhood, and having witnessed their fathers beat their mothers<sup>42</sup>. In our study, we observed that two of every five GBV victims suffered physical violence. We also observed that physical violence risk factors in Peru include the aggressor's age (below 40 years old), prior violence report, victim's age (below 40 years old), and foreign citizenship. In contrast, the physical violence protector factors were the aggressor's school education and the aggressor's paid job.

This study increases the knowledge about GBV and physical violence in one of the countries with a high GBV incidence worldwide; however, several study limitations need to be considered. First, our study used secondary data, so the study is prone to selection and information bias. Such restriction is standard in studies that use national registries. Regardless, GBV's secondary data analysis is of great value and generates evidence to highlight the importance of GBV as an increasing social problem. A second limitation is that our study lacks a proper comparison group, so we assess the physical violence risk factors among the women that were already GBV victims. Regardless, such evidence is of high value for decision-makers that aim to prevent femicides by early recognizing which women among the ones that file a GBV complaint are at higher risk of physical violence. Finally, the study does not include specific cultural or ethnic information, which may allow us to characterize the femicide victims and perpetrators further.

Nevertheless, our results may help identify new opportunities to prevent femicide by using the data already available in the GBV surveillance system.

## Conclusion

GBV is endemic in Peru, but the COVID-19 pandemic reduced its burden significantly in 2020–2021. Despite this reduction, Peru sustained a high GBV incidence with over 846 GBV cases per 100,000 women in 2021. In this scenario, we recognize several characteristics of the cases, victims, and aggressors that have changed over time, offering new opportunities for implementing interventions and policies that address this social problem. The victims' characteristics that significantly increased across 2017–2021 include non-Peruvian citizenship, single status, and history of previous GBV reports. The aggressors' characteristics that increased during 2017–2021 were: foreign citizenship, enablers users, and cohabitation with their victims. On the contrary, the victims' and aggressors' characteristics significantly decreased during the study time were victims from urban areas and aggressors with paid jobs. Additionally, we observed that over two of every GBV victims suffered physical violence. Furthermore, we observed that among the GBV victims, the risk of physical violence decreased when the aggressor had a paid job and had finished high school. However, the risk of physical violence increased when the aggressors were below 40 years old, or the victims had a history of priorly filing a GBV report, aged below 40 years old, and had foreign citizenship.

## Data availability

### Underlying data

We described the metadata and links from each source in [Table 7](#). The data used in our study is open data curated by the Peruvian government and freely available at:

- <https://portalestadistico.aurora.gob.pe/bases-de-datos-2021/>

**Table 7. Metadata for the datasets used in the research article.**

Name	Provider	Year	Format	Variable	Source
Number of cases attended by the urgent care service, according to sex, age group, type of violence, and department	Ministry of Women and Vulnerable Populations (MIMP)	2017–2021	Comma-separated values (CSV)	Continuous	<a href="https://portalestadistico.aurora.gob.pe/bases-de-datos-2021/">https://portalestadistico.aurora.gob.pe/bases-de-datos-2021/</a>
National Deaths Informatics System (SINADEF)	Ministry of Health (MINSU)	2017–2021	Comma-separated values (CSV)	Continuous	<a href="https://www.datosabiertos.gob.pe/dataset/informaci%C3%B3n-de-fallecidos-del-sistema-inform%C3%A1tico-nacional-de-defunciones-sinadef-ministerio">https://www.datosabiertos.gob.pe/dataset/informaci%C3%B3n-de-fallecidos-del-sistema-inform%C3%A1tico-nacional-de-defunciones-sinadef-ministerio</a>
Peruvian Population	National Institute of Statistics and Informatics (INEI)	2017–2021	Comma-separated values (CSV)	Continuous	<a href="https://www.datosabiertos.gob.pe/dataset/poblaci%C3%B3n-peru">https://www.datosabiertos.gob.pe/dataset/poblaci%C3%B3n-peru</a>
Peru regional boundaries	Ministry of the Environment (MINAM)	2007	Shapefile	Continuous	<a href="https://geoservidorperu.minam.gob.pe/geoservidor/archivos/download/Limite_departamental.rar">https://geoservidorperu.minam.gob.pe/geoservidor/archivos/download/Limite_departamental.rar</a>

**Legend:** The "Format" column indicates the extension of the data. The "Variable" column reports the variable type of the data. Finally, the "Source" column presents the links to each dataset used in our study.

- <https://www.datosabiertos.gob.pe/dataset/informaci%C3%B3n-de-fallecidos-del-sistema-inform%C3%A1tico-nacional-de-defunciones-sinadef-ministerio>
- <https://www.datosabiertos.gob.pe/dataset/poblaci%C3%B3n-peru>
- [https://geoservidorperu.minam.gob.pe/geoservidor/archivos/download/Limite\\_departamental.rar](https://geoservidorperu.minam.gob.pe/geoservidor/archivos/download/Limite_departamental.rar)

The official administrative boundaries for Peru regions are owned by the Ministry of Environment and can be accessed through the website <https://www.geogpsperu.com>.

Data are available under the terms of the [Open Data Commons Attribution License \(ODC-By\)](#).

## Acknowledgments

We thank the Ministry of Women and Vulnerable Populations for their diligent work supporting the National Observatory of Violence against Women and Members of the Family Group and the open data used in the study. We also acknowledge the staff and community workers from the Women's Emergency Centers that procure first aid and legal support to the victims of gender-based violence in Peru.

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