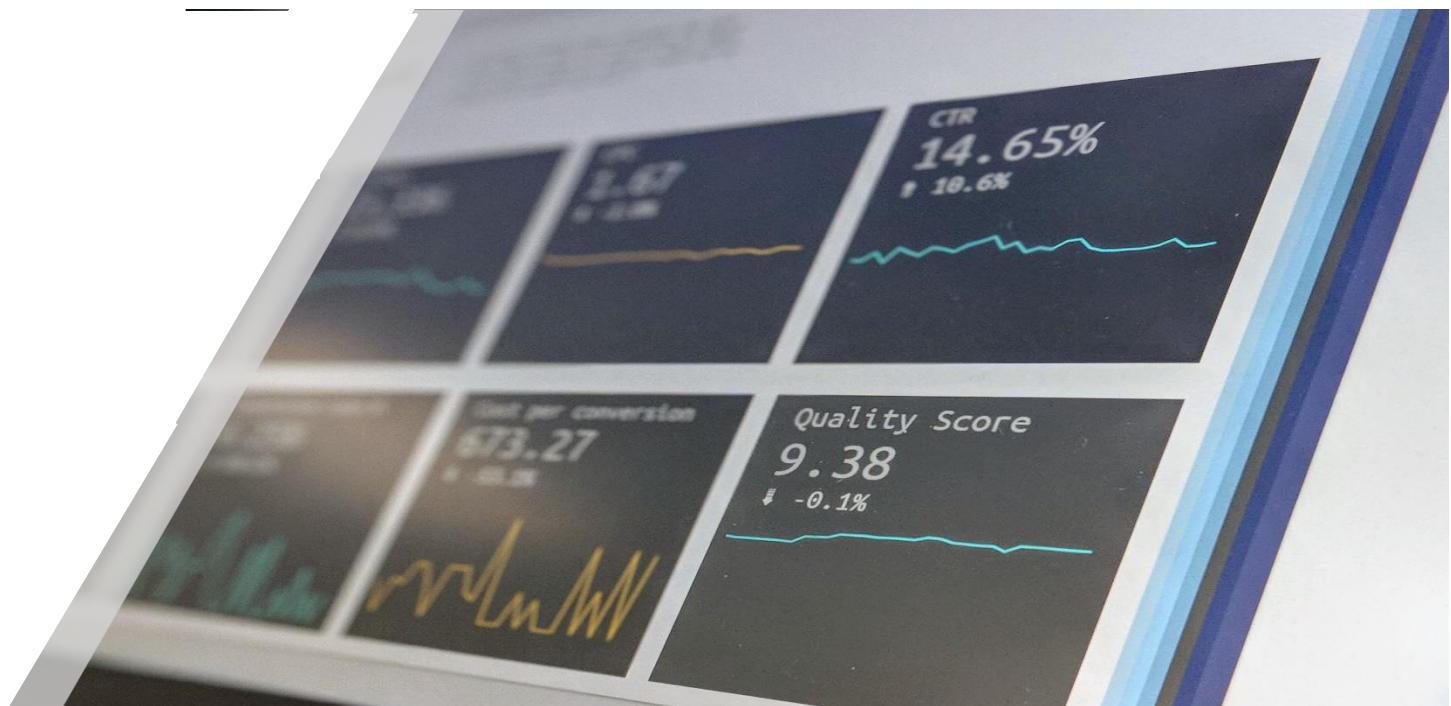


# IDAHO SEXUAL VIOLENCE SURVEILLANCE SYSTEM

INITIAL DEVELOPMENT AND DATA ANALYSIS



IDAHO STATISTICAL ANALYSIS CENTER  
PLANNING, GRANTS & RESEARCH  
IDAHO STATE POLICE

*IN COLLABORATION WITH:*  
SEXUAL VIOLENCE PREVENTION PROGRAM  
RISK REDUCTION AND PREVENTION SECTION  
BUREAU OF COMMUNITY AND ENVIRONMENTAL HEALTH  
DIVISION OF PUBLIC HEALTH  
IDAHO DEPARTMENT OF HEALTH AND WELFARE

# **Idaho Sexual Violence Surveillance System**

## Initial Development and Data Analysis

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## Executive Summary

In 2019, the Idaho Statistical Analysis Center (ISAC) partnered with the Sexual Violence Prevention (SVP) Program at the Idaho Department of Health and Welfare (IDHW) to build a surveillance system and public-facing, interactive data dashboard that would monitor indicators of sexual violence in Idaho. The system is designed to be a resource for all who have an interest in tracking indicators of sexual violence, including SVP and its subgrantees. Starting with a list of indicators selected by the SVP's Evaluation Advisory Committee (EAC), ISAC selected 43 indicators to include in the system. ISAC also performed statistical tests on 14 indicators. This report summarizes the process of indicator selection, as well as the results of the statistical analyses.

## Indicator Selection

- ISAC collected data on 43 (61%) of 71 potential indicators. 26 indicators were available at the state level, and 17 at the county level.
- Of the 28 indicators that were not included, 23 (82%) were excluded because the data was only available at the national level, had not been collected since before 2014, or was not collected in Idaho at any time.
- Selected indicators broke down into three categories: environmental indicators (47%), protective factors (28%), and risk factors (26%).

## Statistical Analyses

- ISAC performed two statistical tests using 14 indicators that were available at the county level.
- Principal components analysis (PCA) grouped the indicators into five components: Crime in Population Centers, Economic Inequality, Prevalence of Violent Crime, Percentage of Population without Health Insurance, and Prevalence of Hate Crime. This model accounts for about 90% of the variance in the data.
- Linear regression results indicate that components created during the PCA comprise a model that significantly predicted rates of rape victimization at the county level in 2017. The model accounted for 22% of the variance in victimization rates between counties.
- The only statistically significant contributor to the model was Economic Inequality. For each increase of 0.16 points in a county's Economic Inequality score, the number of predicted rape victims in that county increases by one.

## Background

In 2019, the Idaho Sexual Violence Prevention (SVP) Program<sup>1</sup> partnered with the Idaho Statistical Analysis Center (ISAC) in furtherance of SVP's Rape Prevention Education (RPE) evaluation plan. According to the evaluation plan, SVP's goals include expanding the program's data collection and analysis capacity, and using that data to inform their selection of sub-recipients and evaluate funded programs. One piece of that strategy includes the development and maintenance of a surveillance system, to be publically displayed on the Idaho Department of Health and Welfare's (IDHW) website, that will allow for the tracking over time of many indicators related to sexual violence in Idaho.

An Evaluation Advisory Committee (EAC) was created to aid in designing an evaluation plan for SVP, including the development of the surveillance system. The EAC, led by SVP staff, consists of stakeholders from multiple agencies. Stakeholders include personnel from two public universities, IDHW staff, representatives of agencies in the criminal justice system (Idaho Department of Correction, Idaho Sheriff's Association, and Idaho State Police), and a contracted program evaluator. Of the five core SVP activities listed in the project narrative for their current RPE grant, four will be supported by the EAC and the surveillance system:

1. identifying and expanding relationships with public and private entities to enhance program implementation and evaluation activities;
2. developing a state action plan for program implementation;
3. developing and implementing a state-level evaluation plan; and
4. identifying and tracking sexual violence indicators.

While the surveillance system directly addresses the fourth activity, it will also provide indirect support for the other three by being a public-facing resource on IDHW's "Get Healthy Idaho" website. SVP plans to use the data to inform their understanding of sexual violence in Idaho and trends over time, prioritize programs and geographic areas to address needs identified by SVP, and evaluate outcomes of local programs funded by SVP.

ISAC was tasked with designing and building the surveillance system and analyzing available data to determine what indicators would be most appropriate to include in the system. This report will detail that process, focusing on the following points:

1. how indicators were selected;
2. results of statistical modeling using the data; and
3. recommendations for making the surveillance system more robust in the future.

## Rape Victimization in Idaho

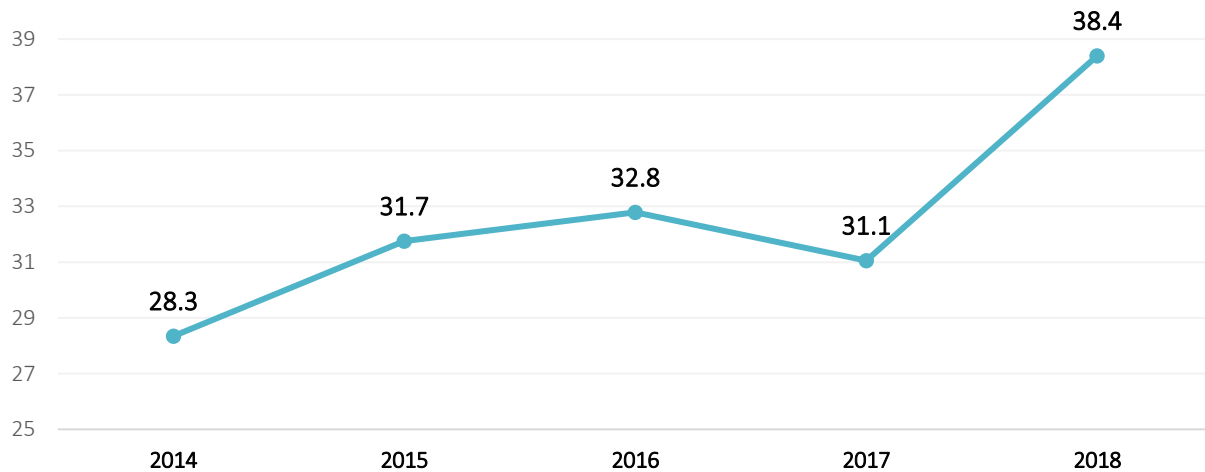
The most reliable measure of victimization in Idaho that is available on an annual basis comes from the National Incident-Based Reporting System (NIBRS), maintained by the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting Program with data collected from law enforcement agencies across the country. This data shows that the rate of rape victims known to law enforcement in Idaho increased by

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<sup>1</sup> The SVP program is located within the Risk Reduction and Prevention Section, Bureau of Community and Environmental health, Division of Public Health, Idaho Department of Health and Welfare.

35% between 2014 and 2018.<sup>2</sup> NIBRS data from 2018 shows that rape victims were mostly female (99%) and high school-age (38% between the ages of 13 and 17). Nearly half (49%) were victimized by a friend or other acquaintance, and 31% were victimized by an intimate partner or family member.

**Idaho Rape Victimization Rates, 2014 - 2018**  
Victims per 100,000 Residents



However, this indicator does not tell the complete story. Nationally in 2018, less than 25% of sexual assault victims reported the crime to law enforcement.<sup>3</sup> It is unknown how Idaho compares to the national figure, which comes from the National Crime Victimization Survey (NCVS). Sampling within Idaho’s relatively small population makes it impossible to drill down to the state level reliably on some national surveys (including NCVS), and a state-specific victimization study has not been conducted in Idaho since 2012. That survey estimated the rate of sexual assault victimization (including rape) was 1,100 per 100,000 residents in Idaho in 2012.<sup>4</sup> Additionally, none of the survey respondents indicated that they reported the assault to law enforcement. For comparison, NIBRS data from 2012 puts the rate at more than 90% lower than the survey results indicated (101 victims per 100,000 residents).<sup>5</sup>

<sup>2</sup> Federal Bureau of Investigation, Uniform Crime Reporting Program. (2019, September 30). Crime data explorer: Incident-based data by state [Data file and code book]. Retrieved from <https://crime-data-explorer.fr.cloud.gov/downloads-and-docs>

<sup>3</sup> U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. (2019, September). *Criminal victimization, 2018* (BJS Publication No. NCJ 253043). Retrieved from <https://www.bjs.gov/content/pub/pdf/cv18.pdf>

<sup>4</sup> Idaho State Police, Idaho Statistical Analysis Center. (2014, April). *Idaho Crime Victimization Survey: 2012*. Retrieved from <https://isp.idaho.gov/wp-content/uploads/sites/16/research/documents/2012Reportc.pdf>

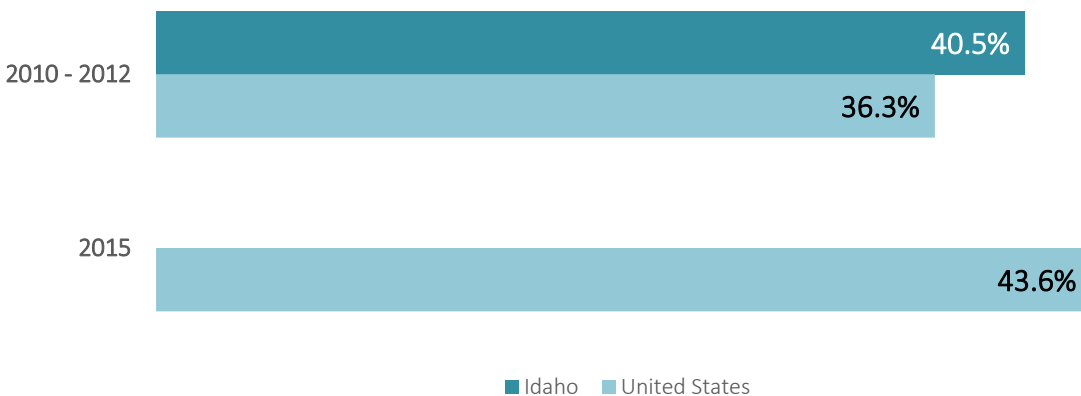
<sup>5</sup> Idaho State Police, Idaho Statistical Analysis Center. (n.d.). *Crime victim services in Idaho: An overview of state and non-profit assistance programs*. Retrieved from <https://isp.idaho.gov/pgr/crime-victim-services/>

## Sexual Assault Victimization Rate in Idaho, 2012 per 100,000 Residents



The National Intimate Partner and Sexual Violence Survey (NISVS), which is conducted by the Centers for Disease Control and Prevention’s Division of Violence Prevention, puts the lifetime prevalence of sexual violence victimization among women in Idaho at 40.5%, compared to the national average of 36.3%.<sup>6</sup> Those numbers, published in 2017, come from surveys conducted between 2010 and 2012. A data brief published by CDC in 2018 indicates that the national figure had increased to 43.6% in 2015,<sup>7</sup> but state-level numbers from that survey have not yet been released.

## Lifetime Prevalence of Sexual Violence Victimization Among Women National Intimate Partner and Sexual Violence Survey



*Note: 2015 data for Idaho not available.*

<sup>6</sup> Smith, S.G., Chen, J., Basile, K.C., Gilbert, L.K., Merrick, M.T., Patel, N., Walling, M., & Jain, A. (2017). The National Intimate Partner and Sexual Violence Survey (NISVS): 2010-2012 State Report. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

<sup>7</sup> Smith, S.G., Zhang, X., Basile, K.C., Merrick, M.T., Wang, J., Kresnow, M., Chen, J. (2018). The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 Data Brief – Updated Release. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

## Indicator Selection

SVP created an Evaluation Advisory Committee (EAC) in order to guide and implement the RPE evaluation plan. Starting with a database supplied by the Centers for Disease Control and Prevention (CDC), the EAC identified 65 indicators for potential inclusion in the surveillance system. These indicators spanned multiple categories, including measures of community violence, economics, and individual-level risk and protective factors that may influence victimization rates.<sup>8,9</sup>

## Literature Review

ISAC conducted a review of sexual violence research independently of the EAC in order to ensure the indicators selected by the committee were appropriate for consideration. Much of the existing research focuses on individual-level risk factors. A meta-analysis conducted by Tharp et al. (2012) found that of 67 identified factors, 35 (52%) showed consistent significant associations with sexual violence perpetration, the majority being individual-level risk factors.<sup>10</sup> These include indicators of alcohol use, cognition patterns (such as acceptance of rape myths, hostility towards women, and acceptance of violence), and psychological factors (such as conduct disorders and suicide attempts). Only two factors were identified at the community or societal level, of which only one (geographic area) showed mixed results in two previous studies.

A more recent literature review published by the California Coalition Against Sexual Assault (CALCASA, 2019) highlighted risk factors for victimization.<sup>11</sup> Similar to the research on perpetration of sexual violence, victimization research has mostly focused on individual-level risk factors. CALCASA found evidence that demographic indicators (gender, sexual orientation, and household income) interact with the same individual characteristics that influence sexual violence perpetration to further increase the risk of victimization. Additionally, CALCASA found studies indicating that men who consume media (movies, television, and video games) that depict sexual violence and objectify women are more likely to buy into rape myths and view obtaining consent from a sexual partner as less important. Regarding protective factors, CALCASA found evidence that “optimal” parental style in response to childhood trauma and having a diverse social network can reduce the risk of sexual violence.

A third review, conducted by Scoglio et al. (2019) identified several factors that exacerbate the risk of revictimization in adulthood after an individual has experienced child sexual abuse, but found only one protective factor.<sup>12</sup> The authors found evidence that those who practiced risky sexual behaviors, had been physically abused as well as sexually abused, were diagnosed with post-traumatic stress disorder

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<sup>8</sup> For more on risk and protective factors, see the “Literature Review” section.

<sup>9</sup> See Appendix A for a full list of selected indicators, as well as whether they were included in the final surveillance system and/or statistical models.

<sup>10</sup> Tharp, A. T., DeGue, S., Valle, L. A., Brookmeyer, K. A., Massetti, G. M., & Matjasko, J. L. (2012). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma, Violence, & Abuse, 14*(2), 133-167.

<sup>11</sup> Center on Gender Equity and Health, University of California San Diego. (2019, September). *Sexual violence research: Findings from a systematic review of the literature 2015-2019*. California Coalition Against Sexual Assault.

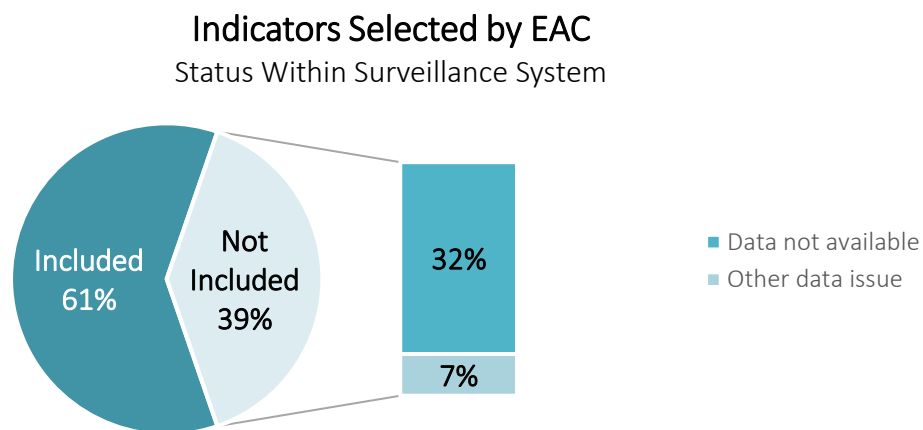
<sup>12</sup> Scoglio, A. A. J., Kraus, S. W., Saczynski, J., Jooma, S., & Molnar, B. E. (2019). Systematic review of risk and protective factors for revictimization after child sexual abuse. *Trauma, Violence, & Abuse*. Advance online publication. doi: 10.1177/1524838018823274



(PTSD), lacked effective coping strategies, and abused alcohol and/or drugs were more likely to be victims of sexual assault as adults. Only two studies cited in this review examined protective factors. Those studies found that high levels of responsiveness from the victim’s parents helped reduce the risk of further victimization as adults.

### Selected Data

The Sexual Violence Prevention (SVP) Program’s Evaluation Advisory Committee (EAC) initially selected 65 indicators for inclusion in the surveillance system. ISAC added six indicators that had not been included in the list provided by the Centers for Disease Control and Prevention (CDC), bringing the total number of potential indicators to 71.<sup>13</sup> Of those 71, 43 (61%) were included in the final surveillance system. 32% of the selected indicators were not available, either because the data is only available at the national level or because data is not available within the time frame the system currently covers (2014 – 2018). Seven percent of indicators were not available due to some other issue, such as the data set being reserved for restricted use or time-series data not being formatted consistently with the other selected indicators.<sup>14</sup>



*n* = 71

Nearly half (49%) of the indicators included in the surveillance system were categorized as “Environmental Factors”. This category includes the outcome variable of interest, rate of rape victims known to law enforcement per 100,000 residents. Also included are other indicators that may be having an effect on sexual violence at the community/society level, such as the overall violent crime victimization rate, number of drug and alcohol abuse incidents on college campuses, and number of workplace discrimination charges filed with the United States Equal Employment Opportunity Commission.

<sup>13</sup> See Appendix A for a full list of selected indicators, as well as whether they were included in the final surveillance system and statistical models.

<sup>14</sup> Two survey data sets aggregated results on a two- or three-year rolling basis, while each of the 43 included indicators do not aggregate data from multiple years in the same manner.

The “Risk Factors” category includes indicators that have been shown in previous research to have an impact on sexual violence victimization at the individual level. Included in this category are indicators such as the percentage of children reporting an Adverse Childhood Experiences score of two or higher, percentage of adolescents who have experienced sexual/dating violence and/or bullying, prevalence of substance use, and indicators of poverty and income inequality.

The “Protective Factors” category includes measures that the CDC and SVP’s EAC suspect may also be having an impact on sexual violence victimization rate in the opposite direction from the “Risk Factors” category. Indicators included as “Protective Factors” include measures of academic engagement and success in K-12 students, family stability and support, and adults’ perceptions of neighborhood safety.

### Types of Indicators Included in the Surveillance System

Indicator Type	Number	Percentage
<i>Environmental Indicators</i>	20	47%
Community Violence	12	28%
Economics/Employment	3	7%
Social/Community Support	1	2%
Substance Use	4	9%
<i>Risk Factors</i>	11	26%
Adverse Childhood Experiences	1	2%
Bullying	1	2%
Community Violence	3	7%
Economics/Employment	4	9%
Social/Community Support	1	2%
Substance Use	1	2%
<i>Protective Factors</i>	12	28%
Community/School Engagement	4	9%
Social/Community Support	8	19%
<b>Total</b>	<b>43</b>	<b>100%</b>

## Statistical Modeling

The Idaho Statistical Analysis Center (ISAC) performed two statistical tests on the surveillance system data. Statistical testing was done to determine whether each indicators selected by the EAC is appropriate to track on an ongoing basis, and to explore the extent to which each indicator is having an effect on victimization rates in Idaho.

The analysis consisted of two steps.<sup>15</sup> First, a principal components analysis (PCA) was performed to find out if any of the indicators could potentially be overlapping or measuring similar concepts. Second, components created during the PCA were used in a linear regression analysis to determine whether they are predictors of sexual violence victimization.

### Principal Components Analysis

Principal components analysis (PCA) is an exploratory type of factor analysis, a set of procedures used to explore the extent to which multiple indicators may be measuring the same concept.<sup>16</sup> In PCA, the total variance between the indicators is analyzed. Indicators that are correlated with each other are grouped together in “components”, with the goal of illuminating common themes among the grouped indicators. Factor scores are created for each case (here, each county), which can be used in subsequent analyses.

Because PCA cannot accommodate time-series data, 14 indicators for which county-level data was available in 2017 were included for analysis.<sup>17</sup> Five components were identified, with three of them containing more than one indicator. The model explains nearly 90% of the total variance in the data. All factor loadings<sup>18</sup> were higher than 0.79, indicating high correlation between the individual indicators and the components they were grouped into (see PCA results table on page 11).

### Linear Regression

Four components obtained from the PCA were used to conduct a linear multiple regression analysis to find out if they are predictors of rape victimization in Idaho. The model does predict rape victimization, and accounts for 22.2% of the variance in rape victimization between counties. The only component that significantly contributed to the model was Economic Inequality. For each increase of 0.16 points in a county’s Economic Inequality score, holding all other components constant, the model predicts one additional rape victim in that county (see regression results table on page 11).

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<sup>15</sup> See Appendix B for methodology for both analyses and full results from the regression analysis.

<sup>16</sup> Mertler, C. A. & Vannatta, R. A. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4<sup>th</sup> ed.). Glendale, CA: Pyrczak Publishing.

<sup>17</sup> Three variables with county-level data available for 2017 were excluded from analysis because they were found to have low factor loadings on multiple components, and did not contribute meaningfully to the model.

<sup>18</sup> A factor loading is the Pearson correlation coefficient between an individual indicator and the component it is grouped into.

## Principle Components Analysis Results

<i>Component Name (in italics)</i> Indicator Name	<i>% Variance Explained per Component (in italics)</i> Factor Loadings
<i>Component 1: Crime in Population Centers</i> 47.28%	
# of drug abuse violations that resulted in disciplinary action reported by colleges and universities	0.995
# of alcohol abuse violations that resulted in disciplinary action reported by colleges and universities	0.990
# domestic/dating violence and stalking offenses reported by colleges and universities	0.989
# of arrests for alcohol abuse violations reported by colleges and universities	0.984
# of children served at accredited Child Advocacy Centers	0.906
# rapes reported by colleges and universities	0.894
# violent crimes reported by colleges and universities	0.876
<i>Component 2: Economic Inequality</i> 17.16%	
Gini inequality index	0.906
Ratio of income inequality (80th percentile divided by 20th percentile)	0.832
% of people living in poverty	0.793
<i>Component 3: Prevalence of Violent Crime</i> 10.55%	
Rate of reported violent crime victims per 100,000 people	0.852
Rate of reported rape victims per 100,000 people	0.832
<i>Component 4: Percentage of Population without Health Insurance</i> 8.47%	
% of people who are estimated to be uninsured	0.961
<i>Component 5: Prevalence of Hate Crime</i> 6.18%	
Rate of hate crimes reported to police per 100,000 people	0.996
<b>Total Variance Explained by the Model</b> 89.64%	

## Linear Regression Results

Component Name	Change in Component Score that Predicts 1 Additional Rape Victim	Bivariate <i>r</i>	Statistical Significance
Economic Inequality	0.16	-.117	.017**
Prevalence of Hate Crime	0.29	.376	.069*
Percentage of Population without Health Insurance	-1.32	-.086	.764
Crime in Population Centers	27.03	-.302	.989

\*Statistically significant at the  $p = .10$  level.

\*\*Statistically significant at the  $p = .05$  level.

## Indicators that Comprise Statistically Significant Predictors of Rape Victimization, by County

County	Rape Victimization Rate	Gini Inequality Index	Ratio of Income Inequality	% People Living in Poverty	Hate Crime Rate
Ada	32.1834	.4640	4.4515	11.8227	3.2840
Adams	0	.4250	4.0957	13.8045	0
Bannock	14.0668	.4520	4.5367	17.6436	1.1722
Bear Lake	66.8003	.4070	4.0801	14.5241	0
Benewah	65.6814	.4260	3.9645	15.8294	0
Bingham	24.1886	.3970	4.0459	13.1456	0
Blaine	9.0695	.4690	4.7883	14.7591	0
Boise	41.6493	.4250	4.2899	11.2892	0
Bonner	9.2672	.4570	4.4202	13.9527	0
Bonneville	27.9552	.4510	4.0180	11.8576	0
Boundary	16.8152	.4980	4.7202	18.3009	0
Butte	0	.4750	4.5053	16.2120	0
Camas	93.0233	.5490	4.7412	22.3476	0
Canyon	33.5748	.4120	3.7631	17.0836	3.2195
Caribou	0	.3930	3.5845	9.3945	0
Cassia	21.0385	.4020	3.6872	14.6839	0
Clark	0	.3610	3.6892	24.1706	0
Clearwater	11.7041	.4180	3.6818	13.9084	0
Custer	0	.4370	5.3686	18.8537	0
Elmore	42.2216	.4260	4.1247	14.9095	7.6767
Franklin	7.3416	.3780	3.4360	12.2410	0
Fremont	23.0769	.3870	3.4422	11.9069	0
Gem	28.7158	.4080	4.2478	20.6886	0
Gooding	26.2123	.4050	3.6239	15.9212	0
Idaho	18.4490	.3870	3.5158	13.4660	18.4490
Jefferson	3.5276	.3710	3.1643	9.5032	0
Jerome	51.5641	.4050	3.8037	16.2501	0
Kootenai	47.3706	.4390	3.9098	12.5894	1.8948
Latah	22.5858	.4700	5.9653	22.4871	2.5095
Lemhi	0	.4170	4.0053	17.1099	0
Lewis	0	.4440	4.0001	15.2722	0
Lincoln	0	.3850	3.3738	11.4651	0
Madison	32.8150	.5040	5.9111	31.8026	0
Minidoka	14.3706	.4270	3.9274	17.9064	0
Nez Perce	26.9113	.4100	3.9144	14.3763	7.3394
Oneida	0	.3920	3.3353	12.5794	0
Owyhee	26.1597	.4820	4.3071	23.3357	0
Payette	17.1821	.4270	4.2842	15.4884	0
Power	0	.3980	2.6710	11.5627	0
Shoshone	103.9584	.4400	4.3161	17.4040	0
Teton	17.8683	.4080	3.9079	8.2505	8.9342
Twin Falls	51.6165	.4180	3.9711	14.3989	3.5193
Valley	65.3595	.4570	3.6393	10.4357	0
Washington	19.5084	.4420	4.3979	15.6544	9.7542

## Limitations

The largest drawback to this analysis is that none of the well-researched individual-level factors that influence sexual violence were able to be included. Some of that data is only available at the state level in Idaho, and other indicators are not available at all. As a result, this analysis only includes a few indicators that have far less of an established link to sexual violence. Collecting data on individuals is best accomplished through surveys, but because Idaho is a large rural state, sampling participants at small geographic levels is difficult and sometimes unreliable. Until this problem is solved, it is likely that Idaho-specific data on individual-level factors will continue to be unavailable for use in this type of analysis.

The fact that Idaho does not have a true measure that captures all victims of sexual assault places another limitation on this study. Although some researchers have begun to examine the factors sexual assault victims consider when deciding whether to report the crime to the police, those factors are still not well understood, especially when the victim is a child.<sup>19</sup> It would be more appropriate to measure victimization using a survey similar to the National Crime Victimization Survey rather than administrative data from law enforcement agencies. Unfortunately, a survey on this topic that is capable of drawing a reliable sample at the state level and below in a rural setting like Idaho, and is performed annually, does not currently exist.

The main limitation of the PCA is the small number of cases. Idaho only has 44 counties. As a general rule, PCA should include at least 300 cases, although components with at least four factor loadings above an absolute value of .60 (such as Component 1: Crime in Population Centers) are considered to be reliable regardless of the number of cases included.<sup>20</sup> One option for addressing this issue would be to analyze data at the city level, rather than the county level. Idaho has 201 incorporated cities, which would bring the number of cases in the analysis closer to that benchmark of 300. However, given that only 14 of the 43 indicators in the surveillance system were available to be analyzed at the county level, the probability of obtaining data at a more granular level is likely low.

Another limitation of the PCA is that it does not allow time-series data to be included. The data analyzed here comes from a single year (2017) and provides only a snapshot of that point in time. In order to determine if the same relationships exist over long periods, this procedure would need to be carried out for every year of available data. It is possible that as Idaho experiences rapid population growth, changes in these indicators could render this analysis obsolete and a different picture of rape victimization in the state would develop.

Conclusions drawn from the regression analysis are limited by the fact that the components, plus the rape victimization rate, were significantly skewed. Although variable transformation procedures were used to try to normalize the data, only two components were no longer skewed after transformation. Skewed data does not necessarily render the results invalid, but does weaken them.<sup>20</sup> Increasing the number of cases included by disaggregating data to the city level would also help mediate this limitation, as it would for the PCA.

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<sup>19</sup> Block, S.D. & Williams, L.M. (2019, March). The prosecution of child sexual abuse: A partnership to improve outcomes (Report No. 252768). Retrieved from <https://nij.gov/publications/pages/publication-detail.aspx?ncjnumber=252768>

<sup>20</sup> Mertler, C. A. & Vannatta, R. A. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4<sup>th</sup> ed.). Glendale, CA: Pyrczak Publishing.

## Conclusions and Recommendations

The goal of the surveillance system the Idaho Statistical Analysis Center (ISAC) created for the Sexual Violence Prevention (SVP) Program is to monitor indicators related to sexual violence in Idaho and use that data in the program's decision-making processes. ISAC utilized a list of indicators provided by the Centers for Disease Control and Prevention (CDC) and prioritized by the SVP's Evaluation Advisory Committee (EAC) to build the surveillance system and carry out statistical testing on the data.

Based on lessons learned from those processes, ISAC makes the following recommendations:

- **Continue to use the EAC to guide data collection and analysis activities.** In recommending data for the surveillance system, the EAC performed well. Nearly two-thirds of the indicators they selected were available at the state level or lower, and 14 were able to be used in multiple statistical analyses. Additionally, the committee selected a good mix of environmental indicators and risk/protective factors, despite the fact that existing research mostly focuses solely on individual-level risk factors. The EAC has shown itself to be a valuable resource for the SVP, and should continue to be maintained as an advisory body regarding data and evaluation activities.
- **Prioritize data that is available at the county-level and below for monitoring via the surveillance system.** The two statistical tests performed by ISAC on county-level data from 2017 indicate that those 14 indicators likely are linked to rates of sexual violence in Idaho. These indicators should continue to be monitored annually. Additionally, the SVP and its partners should work to enhance data collection efforts when possible. The most common reason for excluding indicators selected by the EAC is that the data was only available at the national level, or not at all. For example, seven indicators were excluded because Idaho either does not participate in the survey they came from, or does not ask the relevant question on its version of the survey. The SVP should use the EAC and other relevant partners to explore how to begin collecting that data in Idaho, as well as how to drill down into the existing state-level data. Examining more indicators at the county level and below will strengthen the conclusions drawn from the surveillance system data.
- **Perform the statistical tests outlined in this report annually.** Due to the nature of PCA, the analyses performed by ISAC cannot identify trends in the data. More testing should be done to determine whether the relationships among indicators remain stable or change over time. Analyses should also be done when data quality improves to the point where one or more indicators can be added to the PCA. Performing these tests on a regular basis will allow SVP to adjust to changes in the data over time and be flexible when considering what the most relevant indicators to their program are and where to focus their resources and funding.

## Appendix A: Surveillance System Indicators

### Indicators Selected by the EAC, with Surveillance System and Statistical Model Status

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
114	% of children with two or more adverse childhood experiences	ACEs	Risk Factor	CDC	National Survey on Child Health	State	Yes	No
83	% of students reporting prejudice physical harassment	Bullying	Risk Factor	Gay, Lesbian & Straight Education Network	National School Climate Survey	National	No	No
84	% of students reporting prejudice physical assault	Bullying	Risk Factor	Gay, Lesbian & Straight Education Network	National School Climate Survey	National	No	No
143	% of adolescents bullied on school property in the past 12 months	Bullying	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No
24	Rate of reported rape victims per 100,000 people	Community Violence	Environmental Indicator	Federal Bureau of Investigation	Uniform Crime Reporting Program	Agency	Yes	Yes



CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
139	Rate of violent crime victims per 100,000 people	Community Violence	Environmental Indicator	Federal Bureau of Investigation	Uniform Crime Reporting Program	Agency	Yes	Yes
162	Rate of hate crimes reported to police per 100,000 people	Community Violence	Environmental Indicator	Federal Bureau of Investigation	Uniform Crime Reporting Program	Agency	Yes	Yes
N/A	# of children served at accredited Child Advocacy Centers	Community Violence	Environmental Indicator	ID Network of Child Advocacy Centers	Annual Stats - Accredited Centers	Agency	Yes	Yes
N/A	# rapes reported by colleges and universities	Community Violence	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes
N/A	# violent crimes reported by colleges and universities	Community Violence	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes
N/A	# domestic/dating violence and stalking offenses reported by colleges and universities	Community Violence	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
22	% of child abuse or neglect cases reporting child sexual abuse	Community Violence	Environmental Indicator	US HHS Administration for Children and Families	National Child Abuse and Neglect Data System	State	Yes	No
26	Rate of sexual assaults committed per 100,000 juveniles in residential placement	Community Violence	Environmental Indicator	US DOJ Office of Juvenile Justice and Delinquency Prevention	Census of Juveniles in Residential Placement	State	Yes	No
140	Rate of violent crime index committed per 100,000 juveniles in residential placement	Community Violence	Environmental Indicator	US DOJ Office of Juvenile Justice and Delinquency Prevention	Census of Juveniles in Residential Placement	State	Yes	No
142	% of past month weapon carrying by adolescences on school property	Community Violence	Environmental Indicator	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No
161	# of hate crimes occurring on college campuses	Community Violence	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
N/A	% of individuals who have experienced sexual violence other than rape by any perpetrator in the past 12 months	Community Violence	Environmental Indicator	N/A	N/A	Data Not Available	No	No
N/A	% of women who have experienced rape or attempted rape by any perpetrator in the past 12 months	Community Violence	Environmental Indicator	N/A	N/A	Data Not Available	No	No
1	% of adolescents ever forced to have sexual intercourse	Community Violence	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No
2	% of adolescents who have experienced sexual dating violence in the past year	Community Violence	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	No	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
14	% of individuals who have ever experienced sexual violence other than rape by any perpetrator	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No
15	% of individuals who have experienced rape, physical violence, and/or stalking by an intimate partner in the past 12 months	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No
19	% of individuals who have experienced sexual violence in the past 12 months	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No
23	% of female victims who were minors at the time of 1st victimization of rape, stalking, or intimate partner violence	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
89	% of individuals who have ever experienced stalking	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No
90	% of women who have experienced stalking in the past 12 months	Community Violence	Risk Factor	CDC	National Intimate Partner & Sexual Violence Survey	National	No	No
94	% of adolescents experiencing physical dating violence in the past 12 months	Community Violence	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No
116	% of child protective service non-victims exposed to caregiver domestic violence	Community Violence	Risk Factor	US HHS Administration for Children and Families	National Child Abuse and Neglect Data System	National	No	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
117	% of child protective service victims exposed to caregiver domestic violence	Community Violence	Risk Factor	US HHS Administration for Children and Families	National Child Abuse and Neglect Data System	National	No	No
145	% of children who were a victim or witness to community violence	Community Violence	Risk Factor	CDC	National Survey on Child Health	State	Yes	No
157	% of students completing college by gender	Community/School Engagement	Environmental Indicator	US Dept. of Education	National Center for Education Statistics	State	No	No
45	% of children ages 6-17 engaged in school in the past month	Community/School Engagement	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
46	% of students who graduated high school	Community/School Engagement	Protective Factor	ID Dept. of Education	Assessment & Graduation Rate Results	School	Yes	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
146	% of children ages 6-17 who have participated in organized activities outside of school	Community/School Engagement	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
147	% children ages 6-17 have been engaged in community service or volunteer work in the past 12 months	Community/School Engagement	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
155	Female-to-male median annual earnings ratio	Economics/Employment	Environmental Indicator	US Census Bureau	American Community Survey	County	Yes	No
156	Female wage gap	Economics/Employment	Environmental Indicator	US Census Bureau	American Community Survey	County	No	No
158	# of women owned businesses	Economics/Employment	Environmental Indicator	US Census Bureau	Survey of Business Owners	County	No	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
160	# of employer discrimination charges filed based on violation of the Equal Pay Act of 1963	Economics/ Employment	Environmental Indicator	US Equal Employment Opportunity Commission	Charge Receipts by State	State	Yes	No
163	# of employer discrimination charges filed	Economics/ Employment	Environmental Indicator	US Equal Employment Opportunity Commission	Charge Receipts by State	State	Yes	No
124	% of people living in poverty	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	Yes	Yes
128	Ratio of income inequality	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	Yes	Yes
129	Gini Inequality Index	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	Yes	Yes
135	% of people who are estimated to be uninsured	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	Yes	Yes
131	% of households with food insecurity	Economics/ Employment	Risk Factor	US Census Bureau	Current Population Survey	State	No	No



CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
132	% of households with very low food security	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	No	No
133	% of households with severe housing cost burden	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	No	No
134	% of households with housing cost burden	Economics/ Employment	Risk Factor	US Census Bureau	American Community Survey	County	No	No
159	% of women in state legislature	Social/ Community Support	Environmental Indicator	National Council of State Legislatures	Women's Legislative Network	State	Yes	No
103	% of adults with disabilities who report adequate social support	Social/ Community Support	Protective Factor	Idaho DHW	Idaho Behavioral Risk Factor Surveillance System	State	No	No
104	% of children 6-17 who have an adult mentor	Social/ Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
105	% days individuals ate dinner with any other household members	Social/Community Support	Protective Factor	US Census Bureau	Current Population Survey	State	No	No
106	% of days individuals interacted with family or friends	Social/Community Support	Protective Factor	US Census Bureau	Current Population Survey	State	No	No
115	% of families reporting that all members in the household ate a meal together every day in the past week	Social/Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
118	% of parents always or usually in attendance at child's activities	Social/Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
136	% of parents who feel their neighborhood is safe	Social/Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
137	% of parents who feel their child's (age 6-17 years) school is safe	Social/Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
141	% of LGBTQ students who report that harassment or assault incidents reported to school authorities results in effective intervention	Social/Community Support	Protective Factor	Gay, Lesbian & Straight Education Network	National School Climate Survey	State	Yes	No
148	% of parents reporting their child lives in a supportive neighborhood	Social/Community Support	Protective Factor	CDC	National Survey on Child Health	State	Yes	No
150	Rate of social associations per 10,000 people	Social/Community Support	Protective Factor	US Census Bureau	County Business Patterns	County	Yes	No
153	% of time individuals and neighbors do favors for one another	Social/Community Support	Protective Factor	US Census Bureau	Current Population Survey	State	No	No

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
102	% of adults who report inadequate social support	Social/Community Support	Risk Factor	Idaho DHW	Idaho Behavioral Risk Factor Surveillance System	State	No	No
138	% of students who miss school due to safety	Social/Community Support	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No
42	# of drug abuse violations that resulted in disciplinary action reported by colleges and universities	Substance Use	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes
N/A	# of arrests for alcohol abuse violations reported by colleges and universities	Substance Use	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes
N/A	# of alcohol abuse violations that resulted in disciplinary action reported by colleges and universities	Substance Use	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	Yes

CDC Indicator ID#	Indicator	Construct	Factor Type	Source Agency	Data Set/Survey	Data Level Available	Included in Surveillance System	Included in Statistical Models
41	# of arrests for drug abuse violations reported by colleges and universities	Substance Use	Environmental Indicator	US Dept. of Education	Campus Safety and Security	University	Yes	No
121	Rate of liquor stores per capita	Substance Use	Environmental Indicator	US Census Bureau	County Business Patterns	County	No	No
N/A	% of alcohol-serving establishments with overserving policies	Substance Use	Environmental Indicator	N/A	N/A	Data Not Available	No	No
39	% of past month illicit drug use among minors	Substance Use	Risk Factor	US HHS Substance Abuse and Mental Health Services Administration	National Survey on Drug Use & Health	State	No	No
40	% of adolescents who have been offered, sold, or given an illegal drug on school property in the past 12 months	Substance Use	Risk Factor	ID Dept. of Education	Idaho Youth Risk Behavior Survey	State	Yes	No

## Appendix B: Methodology

### Principal Components Analysis

Principal components analysis (PCA) was initially conducted with 17 indicators from the surveillance system. These include the 14 presented in the final results, as well as three additional indicators: (a) number of arrests for drug abuse violations reported by colleges and universities; (b) percentage of students who graduated high school; and (c) female-to-male median annual earnings ratio. These three indicators were removed due to their low factor loadings on multiple components. Data from 2017 was selected because that year contained the least amount of missing data (no data was missing for any of the 17 initial indicators) and allowed for the inclusion of as many indicators as possible.

The final PCA included 14 indicators and was rotated using the direct oblimin method. Upon examination of four criteria (eigenvalues, variance, scree plot, and residuals), it was determined that five components should be extracted. The final results, including the percentage of total variance explained by each component and factor loadings for all 14 indicators, are available in the body of this report on page 11. Factor scores derived from the PCA were subsequently used in a linear regression analysis.

### Linear Regression

Using the factor scores obtained from the PCA, linear regression was conducted to determine whether the four components (Crime in Population Centers, Economic Inequality, Percentage of Population without Health Insurance, and Prevalence of Hate Crime) were predictors of rape victimization in Idaho in 2017. All five variables were determined to be significantly skewed, and were transformed using the square root (rate of rape victims per 100,000 people), base-10 logarithm (Economic Inequality, Percentage of People without Health Insurance), or inverse value (Crime in Population Centers, Prevalence of Hate Crime). After transformation, Crime in Population Centers, Prevalence of Hate Crime, and rate of rape victims per 100,000 residents remained significantly skewed.

Results indicate that the model does significantly predict rape victimization rates ( $R^2 = .222$ ,  $R^2_{adj} = .142$ ,  $F(4,39) = 2.779$ ,  $p = .040$ ). The model accounts for 22.2% of the variance in rape victimization rates. Regression coefficients and significance values indicate that only one variable, Economic Inequality, was a significant contributor to the model.

Variable Name	<i>B</i>	$\beta$	<i>t</i>	<i>p</i>	Bivariate <i>r</i>	Partial <i>r</i>
Crime in Population Centers	-.037	-.002	-.014	.989	-.117	-.002
Economic Inequality	6.315	.362	2.504	.017	.376	.372
Percentage of Population Without Health Insurance	-.756	-.044	-.302	.764	-.086	-.048
Prevalence of Hate Crime	-3.481	-.271	-1.867	.069	-.302	-.286