The Scope of Family Violence in Ohio: Sources and Methods

2014 update

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The Ohio Family Violence Prevention Project

December 1, 2014

The Ohio Family Violence Prevention Project is
a project of the Ohio Colleges of Medicine Government Resource Center
with support from the HealthPath Foundation of Ohio.

For more information, please visit grc.osu.edu/familyviolenceprevention

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INTRODUCTION

This document details the sources and methods used for compiling findings for the 2014 update of the *Ohio Family Violence County Profiles* and the report *The Scope of Family Violence in Ohio*. For each figure, we provide the exact data source(s) on which the findings are based, the years they were collected and any calculations we made to compute estimates. We intend for readers to use this document as a reference for looking up details regarding specific findings, not as a report to read from beginning to end. Nonetheless, this introductory section provides useful information on how to understand and interpret the findings.

What is family violence?

Our conceptual definition recognizes that family violence occurs in the context of a trust relationship and involves a pattern of behavior over time. Because of these characteristics, the consequences of family violence are especially harmful and complex.[1]

The data on the county profiles help describe the scope of common types of family violence in our county in a single year. Specifically, we focus on:

> ***Child maltreatment:*** When a family member or caretaker neglects basic needs or inflicts physical, sexual and/or emotional abuse. Neglect is the most common type of child maltreatment, followed by physical and then sexual and emotional abuse.
>
> ***Intimate partner violence***: When physical, sexual and/or emotional violence occurs in the context of a current or former relationship. A perpetrator often abuses power in order to control his partner. The most serious injuries and adverse consequences of intimate partner violence are disproportionately experienced by women.
>
> ***Elder abuse and neglect***: When a family member or caretaker neglects basic needs, financially exploits an elder, or inflicts physical, sexual and/or emotional abuse. Neglect is the most common type of elder abuse reported to adult protective services, followed by financial exploitation and then emotional, physical and sexual abuse. Self-neglect is an important related issue, yet it is beyond the scope of our work because it does not require interpersonal interaction. Consistent with our focus on elders, we exclude victims under 60 years old.

These three types are not the only important kinds of family violence; we focus on them because of the paucity of research on other types (e.g., neglect of non-elderly disabled adults).

Key characteristics of the data

Our estimates of the underlying prevalence of family violence refer to the number of unduplicated people who experienced a type of family violence at least once during the year 2012. In epidemiologic terms, these figures are "annual prevalence estimates," or more technically "period prevalence estimates, where the focal point is one year."[2] Also, the figures

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[1] For more details on our conceptual definitions of family violence, see: Health Policy Institute of Ohio. *White paper on improving family violence prevention in Ohio*. Columbus, OH: Health Policy Institute of Ohio; 2008.

[2] Terms like "prevalence" and "incidence" are often used interchangeably in non-technical publications. In epidemiology, "prevalence" (without a qualifying adjective) typically refers to "point prevalence," which is the total number of cases that exist in the population at a given point in time. In contrast, "incidence" refers to the number of new cases that occur during a defined period. Because the acts and consequences of family violence occur over time, it can be difficult to apply these terms in practice. For example, for how long should an abused elder be counted as a "case?" If a woman is threatened by a former spouse in January and punched by a new

refer to the number of victims of violence, not the number of perpetrators. When presenting estimates, we round down numbers to the nearest 1000 for state level estimates, to the nearest 100 for multi-county estimates and to the nearest 10 for county-level estimates. In several instances we report "n/a" for small numbers because estimates would be unreliable.

For several findings, the numbers we present refer to "reports", "petitions," "incidents" or "cases." These totals should not be confused with the number of individuals. A single child who experiences both physical abuse and neglect, for example, would merit two reports to children's services. In contrast, a single petition for a domestic violence civil protection order may seek protection for multiple individuals (e.g., a mother and her children) as protected parties. We try to report counts of unduplicated persons whenever possible, yet often these data are unavailable. Whenever possible, we took the annual mean across multiple years (e.g., 2009, 2010, 2011 and 2012) to provide more stable counts.

In some instances, our figures may not match up with numbers from another source. Usually, such discrepancies can be explained by carefully reading the relevant section of this document. If, after reviewing the material, you think you have found an error, please contact the Ohio Family Violence Prevention Project so we can investigate and correct it.

The county profiles are designed to help policy-makers, professionals and other stakeholders understand and communicate the scope of family violence in their community. They are primarily designed to help with grant writing and public education, but may also be appropriate for program planning or evaluation.

The accuracy of the data

These data represent the best available figures for family violence in Ohio. They are based on a thorough review of current research and have been reviewed by independent researchers and practitioners. In general, they are also internally consistent. Assuming that the most family violence incidents do not come to the attention of authorities, our figures from service agencies suggest that our estimates of the true extent of family violence are not wildly off the mark.

Nonetheless, our prevalence estimates are only an approximation. Measuring the true scope of family violence is difficult, as many victims are isolated and may be unwilling or unable to report their experience to trained professionals, let alone to researchers. Similarly, perpetrators have little incentive to report behaviors that are socially undesirable and illegal.

Another challenge is that our conceptual definition of family violence often includes certain patterns of behavior for which data are unavailable or where findings are too disparate to summarize. Most experts agree, for example, that emotional abuse is a serious, common type of intimate partner violence, yet it is difficult to measure on a survey.[3] Moreover, emotional abuse is often not illegal, so police and other social services have limited capacity to intervene. As a result, service reports are especially likely to undercount individuals experiencing emotional, but not other types of abuse.

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boyfriend in August, should that constitute one or two cases? Consistent with the research literature, we use the term "annual prevalence estimates" to account for the number of unduplicated victims of family violence. Some of our data on other health issues (e.g., new cancer cases, injuries from falls) are incidence data.

[3] Survey estimates of emotional abuse range widely. Conversely, some survey respondents' answers yield "false positives" (even for physical violence), where a person appears to be a victim whereas in fact, the incident did not meet our conceptual definition of family violence.

It is difficult to quantify the extent to which these and other phenomena may result in under-counting or over-counting the number of victims. Overall, we believe these estimates are much more likely to under-count than over-count the true number of victims each year.

To account for the uncertainty of survey estimates, we rely on multiple studies whenever possible to ensure that our estimates do not reflect the bias of any one particular study's methodology. Also, whenever our estimates were based on survey data, we used the 95% lower confidence level estimate.[4] (This is akin to the lower end of the "margin of error" often reported in political polls.) If, for example, a prevalence estimate is 4% ± 1%, we use 3% for calculating the estimated number of victims.

For many of our estimates, we have relied on assumptions that are difficult or impossible to test empirically. Our estimates of teen dating violence, for example, are based on youth enrolled in high school. Thousands of 15-19 year olds across the state do not attend high school, and it is unclear if the prevalence of dating violence in that group resembles that of their peers who are enrolled in school. Our final estimate assumes the prevalence in each group about the same. For each data source, we try to state these assumptions explicitly and describe their potential effect on our estimates. As more information and better research become available, we look forward to updating our estimates.

Finally, we recognize that data based on agency reports inevitably include errors. While we have tried to identify and remedy all such mistakes, readers may find inaccuracies in a county profile. If you think you find an error, please contact the authors so we can investigate and correct it.

Avoid comparing counties

For most data sources used in this study, county comparisons are inappropriate. Most apparent county-level differences in the family violence county profiles are due to four related factors:

> ***Underlying prevalence*** – while family violence is a serious concern in all communities, many studies have found that its underlying prevalence can differ by region.
>
> ***Demographic characteristics*** – regional differences in family violence are often associated with characteristics like the population's age distribution and poverty level.
>
> ***Organizational capacity*** – agencies with more staff and better community relations may elicit more reports of abuse and neglect.
>
> ***Reporting procedures*** – agencies that record every report of family violence may appear to have more family violence than agencies with more selective criteria for recording reports.

Usually readers are tempted to compare counties in order to examine whether (or highlight that) their location has a greater underlying prevalence of family violence. For most data sets, however, differences across counties are more due to organizational capacity and reporting procedures than underlying prevalence. For this reason, we do not recommend individual county-level comparisons for most family violence indicators.

There are, however, two family violence indicators that we believe are appropriate for making some limited county comparisons. New petitions for domestic violence civil protection orders and reports of abuse, neglect and exploitation in long term care facilities are recorded in a relatively similar manner across Ohio. To limit the degree to which apparent differences are due

[4] Most introductory statistics textbooks provide a more thorough discussion of confidence intervals.

to counties' demographic differences, we created four groups of counties for making more appropriate comparisons. These groups are presented in Table 1.

Table 1. Groups of Ohio counties

Major metro core (6)	Adjacent metro (21)		Appalachian (31)		Non-metro (20)	
Cuyahoga	Butler	Madison	Adams	Jefferson	Allen	Knox
Franklin	Clark	Medina	Ashtabula	Lawrence	Ashland	Logan
Hamilton	Clermont	Miami	Athens	Mahoning	Auglaize	Marion
Lucas	Delaware	Ottawa	Belmont	Meigs	Champaign	Mercer
Montgomery	Fairfield	Pickaway	Brown	Monroe	Clinton	Morrow
Summit	Geauga	Portage	Carroll	Morgan	Crawford	Paulding
	Greene	Stark	Columbiana	Muskingum	Darke	Preble
	Lake	Union	Coshocton	Noble	Defiance	Putnam
	Licking	Warren	Gallia	Perry	Erie	Richland
	Lorain	Wayne	Guernsey	Pike	Fayette	Sandusky
		Wood	Harrison	Ross	Fulton	Seneca
			Highland	Scioto	Hancock	Shelby
			Hocking	Trumbull	Hardin	Van Wert
			Holmes	Tuscarawas	Henry	Williams
			Jackson	Vinton	Huron	Wyandot
				Washington		

Major metro core counties include the center cities of Ohio's six largest metropolitan areas: Akron, Cincinnati, Cleveland, Columbus, Dayton and Toledo. Adjacent metro counties refer to those that are immediately adjacent to the metro core counties and are included in the corresponding metropolitan area. Moreover, they tend to have population growth and/or median household income that are well above average. Appalachian counties include those that are officially classified as such by the Appalachian Regional Commission.[5] Non-metro counties include those that did not meet the criteria of the other groups. They include non-Appalachian rural counties (e.g., Wyandot) as well as those with smaller cities outside of major metropolitan areas (e.g., Allen).[6]

By choosing indicators with similar reporting procedures and then grouping counties to reduce differences in demographic characteristics, county-level variation is more likely due to the two remaining factors: underlying prevalence and organizational capacity. Further research will be necessary to try and disentangle the relative contribution of each of these factors to county-level differences in these indicators.

Our estimates of the underlying prevalence of family violence are mostly based on interpolation from national or statewide data. As such, our estimates are largely based on each county's population. Within each county, these estimates are useful for highlighting how the scope of family violence compares with other important threats to health and well-being. Between counties, however, they merely reflect differences in each county's population.

[5] Officially Clermont is classified as an Appalachian county. Yet its proximity to Cincinnati, rapid population growth and high median household income suggest it most resembles other "adjacent metro" counties.

[6] Non-metro counties also include four that are adjacent to Lucas and Montgomery counties but are nonetheless largely rural and characterized by below average median household income and population growth (i.e., Darke, Fulton, Henry and Preble).

When are differences noteworthy?

When comparing quantitative data, apparent differences are often unremarkable. Let us say one county had 86 petitions for domestic violence civil protection orders (DVCPO's) in 2011 but only 80 in 2012. Clearly, the number decreased, but is the decrease noteworthy? After all, it is unreasonable to expect that there will be exactly 86 petitions for DVCPO's each year. In this study, we employ a subjective criterion to identify differences that are noteworthy. Based on some statistical assumptions (although not a statistical test), we calculate a confidence interval that is bounded by upper and lower confidence limits. In Adams County from 2010-2012, 370 DVCPOs were filed, or a mean of (370/3=) 123 per year. In addition, using the formulas below, we calculate a lower and an upper confidence limit (rounded to 0 decimal places).

$$[\#\ CPOs] - 1.96*\sqrt{\#\ DVCPOs} = 370 - 1.96*\sqrt{370} = 111 = \text{lower confidence limit}$$

$$[\#\ CPOs] + 1.96*\sqrt{\#\ DVCPOs} = 370 + 1.96*\sqrt{370} = 136 = \text{upper confidence limit}$$

So the lower confidence limit of the annual mean is (332/3=) 111 and the upper confidence limit is (408/3=) 136. We can use these upper and lower limits to calculate rates and assess changes over time or across regions. As a subjective, conservative criterion, we treated as noteworthy differences where the confidence intervals did not overlap.

Rates in less populous counties are often based on few cases, so the confidence intervals are quite large, making it difficult to conclude that the differences are noteworthy. As a result, sometimes a county's rate may appear to be quite different from a reference rate, but we still conclude that the rates are "about the same."

SOURCES AND METHODS FOR INDICATORS OF FAMILY VIOLENCE

This section describes the sources and methods used to produce the findings that appear on the 2014 update of the *Ohio Family Violence County Profiles* and the report *The Scope of Family Violence in Ohio*.

Population estimates

Population estimates are necessary both to calculate the denominators for rates from agency data (e.g., the number of petitions for domestic violence civil protection orders per 10,000 adult residents) and to apply prevalence estimates interpolated from state and national data. If, for example, at least 4.58% seniors living the community are abused, neglected or financially exploited each year, then about how many individuals would that be in a particular county?

For population estimates, we relied on the 2008-2012 5-year estimates from the US Census Bureau's American Community Survey (ACS).[7] Although these figures are less current than the 2013 ACS estimates, they best parallel the period when most data were collected. Moreover, one-year ACS estimates are not available for some smaller rural counties. We decided that using a consistent source of population estimates was most prudent.

Nonetheless, one limitation of this approach is that our figures may be less accurate for counties with rapid population change. Delaware County, the fastest growing county in the state, increased its population 6.2% between 2010 and 2013. As such, findings based on interpolating

[7] US Census Bureau. 2008-2012 American Community Survey 5-Year Estimates, Sex by Age, Table B01001.

state and national prevalence estimates may undercount the true number of cases by this proportion. Similarly, Cuyahoga County's population decreased by -1.3% between 2010 and 2013, the greatest such decline of all Ohio counties. As such, findings based on interpolating state and national prevalence estimates may over-count the true number of cases by this proportion. Overall, however, we believe these differences will have little if any effect on the study conclusions.

Reports of abuse or neglect filed with children's services

This figure represents the number of reports of different types of child abuse and neglect reported to the child protective service agency in each county in 2011. These reports represent the number of types of abuse and neglect from an incident rather than the number of unduplicated victims. For example, a single child who experiences both physical abuse and neglect would merit two reports.

This figure includes all reports, whether or not they were substantiated or indicated.[8] Under Ohio law, all allegations of child abuse or neglect must be investigated within 24 hours. Because counties vary in their organizational capacity for, and policies governing how and when to investigate cases, as well as their methods for recording allegations, it is difficult to use these data to compare the true scope of child maltreatment across counties. In particular, counties with Alternative Response focus less on investigation and more on assessing and ensuring child safety through family engagement and collaborative partnerships (for cases not involving serious and imminent harm).

Data on reports are collected from each county's child protective service agency by the Ohio Department of Job and Family Services (ODJFS). The figures for the profiles were extracted from a spreadsheet prepared by ODJFS for the Public Children Services Association of Ohio (PCSAO). The data are identical to those reported in the *PCSAO Factbook*.[9]

Child victims of a substantiated/indicated case of abuse or neglect

This figure represents the unduplicated count of number of children who were victims of a substantiated or indicated case of child abuse or neglect in Ohio throughout 2011.[8] These data were collected by the Ohio Department of Job and Family Services through their Statewide Automated Child Welfare Information System (SACWIS) and reported to the National Child Abuse and Neglect Data System (NCANDS).[10] The figures omit abused and neglected children who never come to the attention of child protective services and those whose cases were investigated but could not be substantiated or indicated.

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[8] "Indicated" refers to an investigation disposition that concludes that maltreatment could not be substantiated under state law or policy, but there was reason to suspect that the child may have been maltreated or was at risk of maltreatment.

[9] Public Children Services Association of Ohio. *PCSAO Factbook 2012-13, 11th edition*. Columbus, OH: Author; 2014. Available: http://www.pcsao.org/PCSAOFactbook/11thEdition.html

[10] U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau (2012). *National Child Abuse and Neglect Data System (NCANDS) Child File, FFY 2011 [Dataset]*. Available from the National Data Archive on Child Abuse and Neglect Web site, http://www.ndacan.cornell.edu

Ideally, we would count more than those cases that are formally investigated by child protective services (CPS). The National Incidence Studies of Child Abuse and Neglect, for example, use a sentinel surveillance methodology that also obtains data on children seen by community professionals who were not reported to CPS or who were screened out by CPS without investigation.[11] As such, these estimates provide a more complete measure of child abuse and neglect known to community professionals, including abused and neglected children counted in official CPS statistics as well as those who are not. However the most recent available data are from 2005-6. Since then, Ohio has experienced and is recovering from profound economic distress. Because economic measures like unemployment are strongly associated with child maltreatment, we thought it imprudent to base our estimates on such old data.

Substantiated/Indicted reports of child abuse or neglect

From the SACWIS/NCANDS data reported above, these figures represent the number of cases for each type of abuse and neglect that were substantiated or indicated during 2011.[8] The neglect figures include medical neglect, and the physical abuse figures include shaken baby syndrome. These reports represent the number of types of abuse and neglect from an incident rather than the number of unduplicated victims. For example, a single child who experiences both physical abuse and neglect would merit two reports. Most child victims have only a single report associated with them. Statewide in 2011, about 110 reports were substantiated/indicated for every 100 unduplicated victims.

Children in custody

This figure represents the number of children removed from their homes and placed in state custody during 2011. This includes children in the custody of Children's Services or Juvenile Court for a variety of reasons including delinquency as well as substantiated allegations of abuse and/or neglect. In addition, not all substantiated cases of abuse and neglect result in a child being placed in state custody. Such arrangements are usually temporary and it is possible that a single child may be removed twice during a calendar year.

Data on reports are collected from each county's child protective service agency by the Ohio Department of Job and Family Services (ODJFS). The figures for the profiles were extracted from a spreadsheet prepared by ODJFS for the Public Children Services Association of Ohio (PCSAO). The data are identical to those reported in the *PCSAO Factbook.*[9]

Children in homes with an adult who reports recent intimate partner violence

This measure is based on data from the 2008 Ohio Family Health Survey (OFHS) – a telephone survey of 50,944 adults in Ohio, one of the largest and most comprehensive state-level health surveys in the country.[12] One survey item asked "During the last 12 months, how many times, if

[11] Sedlak AJ, Mettenburg J, Basena M, Petta I, McPherson K, Greene A, Li S.. *Fourth National Incidence Study of Child Abuse and Neglect (NIS–4): Report to Congress, Executive Summary*. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families; 2010.

[12] Steinman KJ, Bonomi AE. *Intimate Partner Violence, Health Outcomes and Care Utilization among Medicaid and Uninsured Populations in Ohio*. Columbus, OH: Ohio Family Health Survey; 2009. Available: https://osuwmcdigital.osu.edu/sitetool/sites/omaspublic/documents/OFHS_Report_Steinman.pdf

any, has anyone hit, slapped, pushed, kicked or physically hurt you?" Those who reported any violence were then asked: "Think about the time of the most recent incident involving a person or persons who hit, slapped, pushed, kicked or physically hurt you. What was that person's relationship to you?" We classified intimate partners as including first dates, dating partners, boy/girlfriends; former boy/girlfriends, live-in partners, spouses, former spouses. Because the survey also asked about the number of children living at home, we can estimate the number of children living in homes where an adult reported intimate partner violence during the past 12 months.

Overall, the 2008 OFHS found that 2.1% of children in Ohio live in such homes (95% confidence interval, 1.8% - 2.5%). (In keeping with our practice of using the lower confidence limit, we use 1.8% as the prevalence estimate for our calculations.) Because the measure of intimate partner violence was limited to physical abuse, it omitted other important types such as emotional abuse and sexual violence that occur in the context of a current or former relationship. Considerable research establishes that different types of intimate partner violence can threaten children's well-being, whether or not they directly witness it.[13] As such, this is a conservative estimate of the number of children exposed to intimate partner violence.

Children who take shelter in a local domestic violence shelter

This figure is based on data provided by the Ohio Attorney General's Office.[14] Each year, they collect information from domestic violence programs receiving funding through marriage licensing fees. Because the data are compiled without a verification process, the data set required extensive cleaning to correct for typographical errors and inconsistent program names. Using data from 2010 through 2012, we report the average number of children sheltered each year. If a shelter was missing data for one or two years, we imputed the mean figure from the available year(s). This figure represents all children sheltered at domestic violence shelters in the county, regardless of victims' actual county of residence. For areas that have no shelter services available, we note that victims may use shelters elsewhere.

It is useful to compare these findings to those from the National Census of Domestic Violence Services.[15] This annual one-day survey contacts every domestic violence program in Ohio (and in other states around the nation) during one day in September to assess how many people they served during the previous day. All 70 domestic violence programs in Ohio participated in 2010 and again in 2011 and 2012. According to this census from these years, an average of 1,016 adults and children combined used emergency shelter or transitional housing during one *day* across the state. In comparison, the shelter data from the Ohio Attorney General's Office indicate that an average of 9,102 adults and children used emergency shelter at domestic violence shelters each *year*. Although the two figures are not comparable because of the different time frames and definitions of "shelter," they do demonstrate that the shelter data from the Ohio Attorney General's Office are unlikely to be inflated.

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[13] Moffitt TE, Klaus-Grawe 2012 Think Tank. Childhood exposure to violence and lifelong health: Clinical intervention science and stress-biology research join forces. *Dev Psychopathol* 2013;25(special 2): 1619-1634.

[14] Attorney General State of Ohio, Crime Victims Section, *Domestic Violence Annual Report [year]*. Spreadsheet data provided by Rachel Hudson, Attorney General State of Ohio, Crime Victims Section on February 25, 2014

[15] National Network to End Domestic Violence. *Census: Domestic Violence Counts*. Washington, DC: Author; 2014. Available: http://nnedv.org/resources/census.html

Women who are physically assaulted by a current or former partner

This measure is based on data from the 2010 Ohio Family Health Survey (OFHS) – a telephone survey of 8,276 adults in Ohio.[16] Survey questions asked about physical intimate partner violence victimization during the past 12 months. This measure omitted other important types of intimate partner violence such as emotional abuse and sexual violence that occurs in the context of a current or former relationship. Also, because the sample was limited to respondents 18 years and older, the estimate excludes teen dating violence among younger people.

The OFHS found past-year prevalence of physical intimate partner violence to be 2.5% (95% confidence interval, 1.8%-3.2%) among women 18-64. (In keeping with our practice of using the lower confidence limit, we use 1.8% as the prevalence estimate for our calculations.) County-specific estimates, however, were unavailable because of insufficient sample (relative standard error>.30) for nearly all counties. Because analyses found no significant differences by county or region in the 2010 OFHS and even in the much larger 2008 OFHS,[12] we used the statewide prevalence estimates for each county.

Our estimates are slightly lower than those reported in similar national studies,[17,18] and recent results from a rigorous national survey[19] indicate that *severe* physical violence by an intimate partner (including acts such as being hit with something hard, being kicked or beaten, or being burned on purpose) was experienced by an estimated 2.3% of women in the past year. Therefore, we view the 1.8% figure as a very conservative estimate.

Women who take shelter in a local domestic violence shelter

This figure is based on data provided by the Ohio Attorney General's Office.[14] Each year, they collect information from domestic violence programs receiving funding through marriage licensing fees. Because the data are compiled without a verification process, the data set required extensive cleaning to correct for typographical errors and inconsistent program names. Using data from 2010 through 2012, we report the average number of adults sheltered each year. If a shelter was missing data for one or two years, we imputed the mean figure from the available year(s). This figure represents all adults sheltered at domestic violence shelters in the county, regardless of victims' actual county of residence. For areas that have no shelter services available, we note that victims may use shelters elsewhere.

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[16] Steinman KJ, Hade EM. *How Does Health Insurance Buffer the Consequences of Intimate Partner Violence in Ohio?* Columbus, OH: Ohio Family Health Survey; 2011. Available: https://osuwmcdigital.osu.edu/sitetool/sites/omaspublic/documents/OFHS2010_Steinman.pdf

[17] Breiding MJ, Black MC, Ryan GW. Prevalence and risk factors of intimate partner violence in eighteen U.S. States/Territories, 2005. *Am J Prev Med* 2008;34(2):112–118.

[18] Tjaden P, Thoennes N. *Full report of the prevalence, incidence and consequences of violence against women: Findings from the National Violence Against Women Survey*. Washington, DC: National Institute of Justice; 2000. Available: http://www.bvsde.paho.org/bvsacd/cd41/survey2.pdf

[19] Breiding MJ, Smith SG, Basile KC, Walters ML, Chen J, Merrick MT. Prevalence and Characteristics of Sexual Violence, Stalking, and Intimate Partner Violence Victimization — National Intimate Partner and Sexual Violence Survey, United States, 2011. *MMWR Surveillance Summaries.* September 5, 2014 / 63(SS08);1-18. Available: http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6308a1.htm?s_cid=ss6308a1_e

It is useful to compare these findings to those from the National Census of Domestic Violence Services.[20] This annual one-day survey contacts every domestic violence program in Ohio (and in other states around the nation) during one day in September to assess how many people they served during the previous day. All 70 domestic violence programs in Ohio participated in 2010 and again in 2011 and 2012. According to this census from these years, an average of 1,016 adults and children combined used emergency shelter or transitional housing during one day across the state. In comparison, the shelter data from the Ohio Attorney General's Office indicate that an average of 9,102 adults and children used emergency shelter at domestic violence shelters each year. Although the two figures are not comparable because of the different time frames and definitions of "shelter," they do demonstrate that the shelter data from the Ohio Attorney General's Office are unlikely to be inflated.

Teenage females (15-19) who experience physical dating violence

It is difficult to estimate the prevalence of teen dating violence because people disagree on how to define and measure the problem. Our estimate is based on national data from the 2013 Youth Risk Behavior Survey (YRBS).[21] The YRBS is conducted by the Ohio Department of Health and the Centers for Disease Control and Prevention every two years, and is a well-regarded measure of the prevalence of different adolescent risk behaviors. It is administered through high schools and so is only representative of youths who are enrolled in grades 9 through 12. The exact question asked respondents how many times during the past 12 months "did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)"

We used the national estimate because Ohio data on dating violence with confidence intervals were unavailable by grade and gender.[22] The Ohio Department of Health issued their own report, however, with published prevalence rates (albeit without confidence intervals or standard errors) that were similar to national figures.[23]

Overall, the YRBS estimates the past-year prevalence of physical dating violence among high school females as 12.99% (95% confidence interval: 11.61%-14.52%). This figure, however, is only for respondents who reported having a boyfriend or girlfriend in the past 12 months. To apply this estimate to all high school females, we multiplied each estimate by 69.5% -- the percentage of female high school students who report having a boyfriend or girlfriend in the past 12 months.[23] So for our final estimate we used a figure of (11.61%*69.5%=) 8.069% for all high school females.

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[20] National Network to End Domestic Violence. *Census: Domestic Violence Counts*. Washington, DC: Author; 2014. Available: http://nnedv.org/resources/census.html

[21] Centers for Disease Control and Prevention. *Youth Risk Behavior Surveillance System online database. Youth Online: High School YRBS*. (US, 2013, physical dating violence). Atlanta, GA: Author; 2014. Available: http://nccd.cdc.gov/youthonline

[22] Because Ohio used a slightly different version of the question, CDC did not publish Ohio's estimates (Personal communication to Kenneth Steinman by Laura Kann, Division of Adolescent and School Health, Centers for Disease Control and Prevention, March 23, 2010)

[23] Ohio Department of Health. *2013 Youth Risk Behavior Survey Results: Weighted Data Detailed Tables*. Columbus, OH: Author; 2014. Available: https://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/chss/adolescent%20health/2013OHH%20Detail%20Tables.ashx

Because YRBS estimates are for 9th through 12th graders, it was necessary to adjust them to be consistent with our age group of 15-19 year old females. Because there were no significant differences by grade, we simply applied the overall prevalence estimate to the entire age group.

As with any assessment method, the YRBS has some limitations. Self-report survey measures of teen dating violence are simplistic and may capture some experiences that are later recognized as non-violent during in-depth follow up interviews.[24] On the other hand, the YRBS measure excludes other types of dating violence such as psychological abuse, with examples ranging from verbal threats to unwanted sexting.[25] As a result, our estimate may undercount girls who experience this type of abuse, but not completed physical violence. Also, the YRBS excludes out-of-school youth, such as those who are institutionalized or have dropped out. Although there are no prevalence estimates for dating violence in these hard-to-reach populations, compared to in-school youth they are often more involved in risk behaviors. As such, our estimate may underestimate the true scope of the problem.

Given the difficulty of assessing the prevalence of teen dating violence, it is useful to compare our estimate to findings from other studies. One review of research literature found that prevalence rates from different studies ranged from 9-23%.[26] Another national study of teens (not included in the review) used a more complete measure and estimated "minor" physical dating violence at 10% for all females during the past 18 months.[27] Yet another reported that 3.6% of 13-17 year olds had experienced dating violence in the past year and 1.3% had experienced dating violence with injury.[28] The difficulty of comparing other studies to our estimates is that they use different measures and samples include many adolescents younger than our 15-19 year old age group. Nonetheless, we conceptualize our prevalence estimate as including both serious and minor types of physical teen dating violence.

By applying a statewide estimate to individual counties, we assume that the prevalence of physical dating violence is similar across different regions of Ohio. To date, the few studies that examine community-level variation in teen dating violence have found modest differences across different schools and neighborhoods.[29] Similarly, our own review of YRBS data from 38 US states found few differences in past-year prevalence. Across locations, rates for female high school students ranged from 16.1% (Louisiana) to 7.73% (Utah), but 32 of the 38 reporting states did not differ significantly from the US mean. As such, we feel comfortable applying this prevalence estimate to each Ohio counties as a cautious, conservative estimate of the prevalence of teen dating violence.

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[24] Foshee VA, Bauman KE, Linder F, Rice J, Wilcher R. Typologies of adolescent dating violence : Identifying typologies of adolescent dating violence perpetration. *J Interpersonal Violence*, 2007 ;22(5) : 498-519.

[25] Offenhauer P, Buchalter A. *Teen Dating Violence: A Literature Review and Annotated Bibliography*. Washington, DC: US Department of Justice; 2011. Available: https://www.ncjrs.gov/pdffiles1/nij/grants/235368.pdf

[26] Hickman LJ, Jaycox LH, Aronoff J. Dating Violence among adolescents: Prevalence, gender distribution and prevention program effectiveness. *Trauma, Violence & Abuse,* 2004*;* 5(2):123-142

[27] Halpern CT, Oslak SG, Young ML, Martin SL, Kupper LL. Partner violence among adolescents in opposite-sex romantic relationships: findings from the National Longitudinal Study of Adolescent Health. *Am J Public Health.* 2001;91:1679–1685.

[28] Finkelhor D, Ormrod R, Turner H, Hamby SL. The victimization of children and youth: A comprehensive, national survey**.** *Child Maltreat* 2005; 10; 5-25.

[29] Spriggs AL, Halpern CT, Herring AH, Schoenbach VJ.. Family and school socioeconomic disadvantage: Interactive influences on adolescent dating violence victimization. *Soc Sci Med*. 2009;68(11):1956-1965.

Teenage females (15-19) who are forced to do sexual things by someone they are dating

Sexual coercion is central to dating violence, yet is often not captured in survey measures of physical abuse. To estimate the prevalence of sexual dating violence among teenage females, we used Ohio-specific data from the 2013 Youth Risk Behavior Survey (YRBS; see above, "Teenage females (15-19) experience physical dating violence"). The survey item asked respondents how many times in the past 12 months did "someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)"

Overall, the YRBS estimates the past-year prevalence of sexual dating violence among Ohio high school females as 13.35% (95% confidence interval: 10.58%-16.72%). This figure, however, is only for respondents who reported having a boyfriend or girlfriend in the past 12 months. To apply this estimate to all high school females, we multiplied each estimate by 69.5% -- the percentage of female high school students who report having a boyfriend or girlfriend in the past 12 months.[23] So for our final estimate we used a figure of (10.58%*69.5%=) 9.278% for all high school females.

Because YRBS estimates are for 9th through 12th graders, it was necessary to adjust them to be consistent with our age group of 15-19 year old females. Yet there were no significant differences by grade, so we applied the overall prevalence estimate to the entire age group.

By applying a statewide estimate to individual counties, we assume that the prevalence of sexual dating violence is similar across different regions of Ohio. A review of YRBS data from 31 US states found that rates for female high school students ranged from 16.39% (Hawaii) to 11.56% (Kansas), but no state differed significantly from the US mean. As such, for the purposes of this project we feel comfortable applying this prevalence estimate to each Ohio counties as a cautious, conservative estimate of the prevalence of teen dating violence.

Victims involved in domestic violence incidents handled by law enforcement

This figure is based on data from the 2009-2012 calendar years for domestic violence incidents recorded by local law enforcement agencies and reported to the Ohio Incident-Based Reporting System (OIBRS). OIBRS, a voluntary crime reporting program, is Ohio's version of the FBI's National Incident Based Reporting System. Law enforcement agencies submit crime statistics to the state government which are then available for advanced queries and analysis.[30] OIBRS data used in this study included incident number, date and city and zip code for each incident classified as ORC §2919.25, including subsections (A), (B) or (C).[31] Each incident refers to one or more offenses committed by the same offender, or group of offenders acting in concert, at the same time and place. [32] Based on incident zip code and city, we were able to determine the county

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[30] Ohio Office of Criminal Justice Services. Ohio Incident-Based Reporting System, 2014. Ohio Department of Public Safety. Available: http://ocjs.ohio.gov/oibrs . We acknowledge the support of Dr. Lisa Shoaf and Alan Wedd of the Ohio Office of Criminal Justice Services, Ohio Department of Public Safety for their assistance providing us with the data and assistance with interpretation.

[31] Ohio Revised Code. §2919.25 Domestic violence. Available: http://codes.ohio.gov/orc/2919.25

[32] Federal Bureau of Investigation, US Department of Justice. *National Incident-Based Reporting System (NIBRS) User Manual*. Washington, DC: Author; 2013. Available: http://www.fbi.gov/about-us/cjis/ucr/nibrs/nibrs-user-manual

in which the incident occurred.[33] It is important to note that these numbers correspond to domestic violence incidents and not arrests and that a report is filed for each victim in the incident.[34] Thus, this figure refers to the number of victims involved in domestic violence incidents recorded by police. They may include women, men and children.

From 2009 through 2012, Ohio's 1,013 law enforcement agencies recorded an average of 46,599 domestic violence incidents per year, with annual totals ranging from 45,933 to 47,343. The number of participating agencies differed each year as some agencies ceased to exist while other began to participate in OIBRS. Overall, 321 of 1,013 listed law enforcement agencies submitted at least one report per year for all four years, and an additional 77 agencies reported 3 years of data.[35] Together, these 398 agencies cover 70.7% of Ohio's population.

We created county-level estimates for those counties that met two criteria: (1) Reporting agencies with at least 3 years of valid data serve at least 66% of the county's population; and (2) the county sheriff had at least 3 years of valid data.[36] For counties that met these criteria, we felt that imputing the remaining data for a county would give a reasonable approximation of the number of victims involved domestic violence incidents handled by law enforcement.

Of Ohio's 88 counties, 58 met both the criteria. Table 2 lists those that did not. In Butler County, for instance, the Sheriff reported 4 years of data, but several other agencies did not, so only 22.9% of the county's population was served by agencies with 3+ years of valid data. Of particular note, neither Noble nor Sandusky counties had any law enforcement agencies with 3+ years of OIBRS data during this period.

For the 58 counties with adequate OIBRS data, we calculated the mean annual number of victims involved in a domestic violence incident recorded by law enforcement.[37] Carroll, Fayette, Scioto and Union counties had 100% of their population served by agencies with 3+ years of OIBRS data. For other counties (with the sheriff's office and at least 66% of their population served by OIBRS-reporting agencies), we imputed the number of calls proportionately based on the population. The law enforcement agencies in Adams County, for instance, serve 85.9% of the county's population and record an average of 81 victims in domestic violence incidents per year. So we estimate the number of victims as (81/.859=) 94 for all residents of Adams County.

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[33] From 2009-2012, there were 1,125, 1,802, 2,002 and 2,297 incidents respectively that we could not match to a county based on zip code or municipality, either because of discrepancies or missing data. Instead we used reporting agency name (ORINO) to determine county.

[34] Overall, 12.7% of reported incidents involved more than one victim.

[35] In addition, 510 agencies reported no incidents, although many of these served airports, parks and other non-municipal jurisdictions that were less likely to handle domestic violence incidents. Most, however, simply did not participate in OIBRS. The cities of Hamilton and Springfield were the largest cities that did not participate in OIBRS during this period.

[36] Data from sheriffs' offices are important because in many counties they share patrol duties with local agencies. A town's police force, for instance, might handle domestic violence incidents from 6am to 6pm, whereas the sheriff's office handles them at other times.

[37] For agencies with 3 years of data, we did not impute data for the missing year because in some cases the true value may have been zero. Sometimes patrol duties change, so an agency may refer domestic violence incidents to another agency better equipped to handle them. To determine why certain agencies started or stopped reporting OIBRS data would require inquiries of dozens of agencies; an effort beyond the scope of this study.

Table 2. Thirty counties with inadequate OIBRS data to generate county-level estimates of the number of victims involved in police-recorded domestic violence incidents, 2009-2012

County	# years that sheriff reported any domestic violence incident	% of county population served by agencies with 3+ years of OIBRS data
Allen	0	24.2%
Ashtabula	1	3.9%
Auglaize	4	60.5%
Belmont	4	63.7%
Butler	4	22.9%
Clark	4	53.1%
Columbiana	4	65.6%
Cuyahoga	0	64.9%
Darke	3	62.9%
Geauga	4	44.4%
Highland	0	28.8%
Jackson	1	41.0%
Jefferson	4	54.9%
Knox	1	5.8%
Lake	0	5.5%
Licking	0	49.0%
Logan	4	60.6%
Mahoning	0	90.2%
Medina	2	37.1%
Muskingum	0	33.3%
Noble	1	0.0%
Ottawa	0	20.3%
Perry	2	17.2%
Portage	4	54.2%
Sandusky	0	0.0%
Seneca	4	60.1%
Summit	4	61.2%
Washington	2	35.4%
Williams	0	42.5%
Wood	4	65.0%

This approach assumes that participation in OIBRS is unrelated to how agencies handle domestic violence incidents. Such an assumption is questionable, as law enforcement agencies vary in how they respond to domestic violence calls for service. In particular, larger departments are more likely to have more extensive formal policies,[38] and are also more likely to participate in OIBRS. If non-OIBRS-participating agencies handle proportionately fewer domestic violence incidents, our estimates may overstate the number of victims.

Yet to not impute would likely dramatically understate the number of victims in many counties. Overall, the unadjusted tallies for the 58 counties with OIBRS findings included in this study average 29,340 per year. Our imputed estimates raise that figure to 34,868 – an 18.8% increase.

[38] Townsend MD, Hunt D, Kuck S, Baxter C. *Law Enforcement Response to Domestic Violence Calls for Service.* Washington, DC: US Department of Justice; 2006. Available: https://www.ncjrs.gov/pdffiles1/nij/grants/215915.pdf

In summary, we report the unadjusted tallies for the statewide total (46,599) suppress findings for the 30 counties with inadequate data, and report the imputed estimates for the 58 counties with adequate data. For calculating rates in these counties, we use confidence intervals based on the imputed number of cases (see above, "When are differences noteworthy?"), and then calculate rates per 10,000 county residents.

Petitions for domestic violence civil protection orders

Based on data gathered by the Supreme Court of Ohio,[39] this figure represents the number of new petitions for domestic violence civil protection orders (DVCPO) (pursuant to ORC §3113.31)[40] that are filed with the Clerk of the Court in each county's Domestic Relations Division of the Court of Common Pleas. These include all petitions, regardless of whether is DVCPO is actually issued or what happens subsequently. Petitioners may seek protection for and include other family and household members on their own petition (e.g., a mother and her children) and it is possible for a victim to file more than one petition in a year.

These figures represent only a fraction of the total number of domestic violence victims who interact with the court system each year. Some victims may choose to file a petition for a Stalking or Sexually Oriented Offense Civil Protection Order instead of a DVCPO, even if the perpetrator is a family or household member. Others may file a motion for a Domestic Violence Temporary Protection Order in Criminal Court arising out of a complaint alleging domestic violence. Neither of these types of orders is included in our tallies of DVCPOs.

Because DVCPO petitions are recorded in a relatively similar manner across Ohio, they can be useful for making some limited comparisons across counties and over time. To create more reliable estimates, we calculated annual averages for the three-year periods: 2007-2009 and 2010-2012 and then calculated rates per 10,000 adults. As a denominator for each time period, we used the entire county population (i.e., 18+ years) for the middle year (i.e., 2008; 2011).[41]

Seniors in the community who are abused, neglected, or financially exploited

Conceptually, our definition of elder abuse and neglect is limited to people 60+ years old and includes emotional, physical, sexual and financial abuse as well as neglect, but excludes self-neglect. We based our estimates on the National Elder Mistreatment Study,[42] a nationally representative telephone survey of 5,777 seniors funded by the National Institute of Justice. The study found that 11% of seniors experienced at least one type of mistreatment in the past year, including 4.6% for emotional abuse, 1.6% for physical abuse, 0.6% for sexual abuse, 5.1% for potential neglect, and 5.2% for financial abuse (by a family member). Most of these estimates were not consistent with our conceptual definition of elder abuse and neglect because they

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[39] Supreme Court of Ohio (2013). *Domestic Violence Overall Caseloads.* Available: www.supremecourt.ohio.gov/JCS/domesticViolence/resources/OverallCaseloadsDataOCSR.xlsx

[40] Ohio Revised Code §3113.31. Domestic violence definitions – hearings. Available: http://codes.ohio.gov/orc/3113.31

[41] Minors are now eligible to petitions for domestic violence civil protection orders. Because very few actually do so, we chose to use the adult population as a denominator for calculating rates.

[42] Acierno R, Hernandez-Tejada M, Amstadter AB, Resnick HS, Steve K, Muzzy W, Kilpatrick DG. Prevalence and correlates of emotional, physical, sexual, and financial abuse and potential neglect in the United States: The National Elder Mistreatment Study. *Am J Public Health*, 2010; 100: 292 – 297.

included strangers – not just family members or caregivers – as perpetrators. Thus, we based our estimate on the 5.2% of seniors who reported current financial abuse because it was limited to family members as perpetrators. The study's principal investigator provided a standard error for this estimate (.00315)[43] from which we calculated a confidence interval of 4.58% to 5.85%.

This approach is not without its limitations. Because financial abuse was more common than other types of maltreatment, our estimate may reflect financial abuse rather than other types. Nonetheless, the estimate does not include individuals who experience other types of abuse and neglect, but not financial abuse. Moreover, seniors who are cognitively impaired and socially isolated may be at greatest risk for abuse and neglect, yet are less likely to participate in surveys.

Given the limitations of basing our prevalence estimate on only one study, it is helpful to compare our estimates to findings from other research. One reputable, yet dated, source acknowledged the paucity of good prevalence estimates, stating "Estimates of the occurrence of abuse and neglect have varied from about 2–10 percent annual incidence, although the bases for these estimates are modest and uncertain."[44 (p. 73)] more recently, a review of 41 studies concluded that 6% of elders in general population samples had been abused in the last month,[45] and a 2013 symposium of leading researchers offered a figure of 1 in 10 per year.[46] In summary, our estimate appears to be quite conservative compared to conclusions from other studies and other approaches, although the true scope of elder mistreatment remains uncertain.

To estimate the number of community-dwelling victims of elder abuse and neglect in each county, we multiplied the prevalence rate by the number of residents 60+ years old, minus our estimate of the number living in long term care facilities (see below).

By interpolating a national rate to Ohio we make several assumptions. First, we assume that the problem is equally common in both Ohio and the United States. Unfortunately the paucity of research makes it difficult to assess whether this assumption is reasonable. Within Ohio, however, counties vary considerably in their levels of poverty and other community level factors associated with elder abuse and neglect. Nonetheless, without a clear method for adjusting rates for each county, we apply our estimated ranges to the population of seniors 60+ in each county. As such, county-specific estimates should be interpreted as only an approximation of the true number of abused and/or neglected community-dwelling seniors in each county.

Reports of abuse, neglect or exploitation filed for seniors in the community

By law, every county in Ohio must designate an agency that investigates allegations of abuse, neglect and self-neglect of adults. The units of these agencies (i.e., "adult protective services" or APS) submit quarterly reports to the Ohio Department of Job and Family Services (ODJFS) that

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[43] Personal communication to Kenneth Steinman by Ron Acierno, Medical University of South Carolina, March 15, 2010.

[44] National Research Council. *Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America*. Panel to Review Risk and Prevalence of Elder Abuse and Neglect. RJ Bonnie, RB Wallace, Editors. Committee on National Statistics and Committee on Law and Justice, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press; 2003.

[45] Cooper C, Selwood A, Livingston G. The prevalence of elder abuse and neglect: a systematic review. *Age & Aging*, 2008;37:151-160.

[46] Institute of Medicine and National Research Council. *Elder abuse and its prevention: Workshop summary.* Washington, DC: National Academies Press; 2014. Available: http://www.nap.edu/catalog.php?record_id=18518

summarize this information. APS reports refer to the number of types of maltreatment, rather than individuals. For example, a single victim who experiences both physical abuse and neglect would merit two reports.

From these data, ODJFS publishes a yearly management summary report that tallies figures from reporting counties and provides a breakdown of the number of allegations, the types of alleged maltreatment (e.g., physical abuse; neglect), the disposition of investigations and information on perpetrators and victims. [47] To provide more stable estimates, we extracted data from the these reports for state fiscal years 2009-10, 2010-11, 2011-12 and 2012-13 and then computed the annual mean. Unfortunately, ODJFS's current data management system does not enable users to generate results for each county.[48]

Instead we relied on the total number of cases reported for each county's APS agency as reported on ODJFS county profiles.[49] ODJFS staff have no oversight of what is reported in the county profiles, and so were unable to verify their accuracy. To provide more stable estimates, we extracted data from the county profiles for state fiscal years 2009-10, 2010-11, 2011-12 and 2012-13 and then computed the annual mean. These totals include all cases handled by APS including self-neglect and victims <60 years old. Because self-neglect and victims under 60 years old were not part of our conceptual definition of elder abuse, we sought to exclude such reports in our estimates. Towards this end, from the statewide yearly management summary report, we took the overall proportion of cases other than self-neglect (53.3%) and applied it to each county's total. Then, we considered whether the county APS agency accepted cases from any adult 18+ years old (15 counties) or only adults 60+ years old (73 counties). Across the state, 96.7% of APS reports were among alleged victims 60+ years old, so we applied this figure to the total for each of the counties that handled cases for victims under 60 years old.

The following examples illustrate our approach.

> *Franklin County's APS agency works with alleged victims 60+ years old and they received an average of 1,246 reports each year from 2009-2013. We assumed 53.3% of these reports were not self-neglect, and all involved victims 60+ years old; thus, we calculated that Franklin County has about (1246*.53=) 664 reports of elder abuse and neglect each year.*
>
> *Lucas County's APS agency works with alleged victims 18+ years old and they received an average of 690 reports each year from 2009-2013. We assumed 53.3% of these reports were not self-neglect, and that 96.7% involved victims 60+ years old; thus, we calculated that Lucas County has about (690*.533*.967=) 356 reports of elder abuse and neglect each year.*

This approach offers a reasonable approximation of the number of reports of elder abuse and neglect handled by the APS agency in most counties. There are however some important limitations. Reviewing data from our previous study (when we were able to extract APS yearly management summary reports for each county), we found significant county-level variation in

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[47] Ohio Department of Job and Family Services, Adult Protective Services. (2014). *Yearly Management Summary Report.* Columbus, OH: Unpublished.

[48] Personal communication to Kenneth Steinman by Leslie McGee, Bureau of Protective Services, Ohio Department of Job and Family Services, February 25, 2014. At Ms. McGee's suggestion, we contacted the local APS agency in all 88 counties to request the reports. We were unable to connect with most agencies, and the majority of those we did reach indicated that they were unable to locate their management summary reports. Only Butler, Fairfield and Monroe counties were able to provide reports for their counties.

[49] Ohio Department of Job and Family Services. *[2009;2010-11;2012;2013] County Profiles*. Columbus, OH: Author; 2014. Available: http://jfs.ohio.gov/county/cntypro/index.stm

the proportion of non-self-neglect cases. From state fiscal years 2006-07, 2007-08, and 2008-09, the proportion of each county's total reports that were not self-neglect ranged from 84.6% in Lawrence County to 26.9% in Auglaize County.[50] Fortunately, most counties' proportions from 2006-2009 were similar to our current statewide figures of 53.3% for non-self-neglect cases.

Table 3. Counties with 2006-09 proportions of APS non-self-neglect reports that differed markedly from the 2009-13 statewide mean of 53.3%.

	mean annual # APS reports (2009-13)	estimated # of APS reports that were not self-neglect (2009-13)*	% of APS reports that were not self-neglect (2006-2009)	alternative estimated # of APS reports that were not self-neglect (2009-13)**
Lawrence	63	34	84.6%	53
Paulding	4	2	75.0%	3
Morgan	5	3	71.4%	4
Carroll	36	19	33.3%	12
Fairfield	182	97	32.0%	58
Meigs	29	15	32.0%	9
Medina	62	33	31.7%	20
Noble	39	21	30.4%	12
Hardin	21	11	29.3%	6
Auglaize	22	12	26.9%	6

**based on statewide estimate of 53.3% of all cases.*
*** based on the county-specific % of non-self-neglect reports from 2006-09*
Note: the data in this table include reports for all alleged victims 18+

Nonetheless, Table 3 identifies 10 counties whose proportions differed markedly from the statewide mean. In Fairfield County, for example, we know that the APS agency opens about 182 cases per year. Applying the statewide proportion of non-self-neglect cases (53.3%), we estimate that 97 of these cases are for reports other than self-neglect. APS data from Fairfield County from 2006-09, however dated, suggest that the proportion might only be 32.0%. As such an alternative estimate would be (182*.320=) 58 cases per year.[51]

This table illustrates how our approach probably did not produce very biased estimates. Note that all the countries listed have small to medium-sized populations and most handle relatively few APS reports per year. Because we rounded the number of reports to the nearest ten,[52] we concluded that are approach is a reasonable rough approximation of the number of elder abuse and neglect reports handled by each county's APS agency. Nonetheless, because each county may record allegations differently, these data are unfit for comparing individual counties.

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[50] Our review of 2006-09 data found far less county-level variation in the proportion of cases that were for alleged victims under 60 years old. Only Brown (62.6%) and Logan (56.4%) counties still today handle alleged victims <60 years old and, according to the 2006-09 data, had a much lower proportion of their cases among alleged victims 60+ years old (62.6% and 56.4% respectively). Again, we were unable to determine if such proportions are applicable today.

[51] As it turns out, Fairfield County is one of the three counties that provided county-specific data for 2009-13 (see footnote [48]). The actual mean annual number of non-self-neglect cases for 2009-13 was 110 – much closer our initial estimate of 97 than to the alternative estimate of 58.

[52] So for instance, the original estimate for Noble County would be 20 reports per year and the alternative estimate would be 10.

Seniors in long term care facilities who are abused, neglected, or financially exploited

The few studies that have tried to assess the prevalence of abuse and neglect in long term care facilities are limited by small samples and subjective measures. One study found that 10% of nursing home staff acknowledged abusing patients during the past year,[53] and other self-report surveys have documented even higher rates. [45] In contrast, studies that rely on agency reports may be more objective but identify only a small proportion of cases, typically around 2-5% of all residents.[45] Absent any gold standard method, we settled on an admittedly subjective estimate of 5% of senior residents of long term care facilities.

This figure is equivalent to the prevalence figure of elder abuse among seniors living in the community. Compared to their peers in the community, seniors living in long term care facilities tend to be more cognitively impaired and thus vulnerable to abuse, neglect and exploitation, yet they are less likely to be isolated and so may be less vulnerable to abuse.

To estimate the number of senior residents of long term care facilities, we took the number of residents beds in Ohio's long term care facilities[54] and made two assumptions based on a recent study[55]: (1) 87.0% of such beds are occupied at some point each year and 87.3% of residents are age 60 years or older. We then multiplied our prevalence estimates by .870 x .873 x the number of beds in long term care facilities in each county. To the extent that certain counties have an unusual vacancy rate or proportion of residents under 60 years old, our figures may be biased. For counties with small, potentially unreliable estimates, we use "n/a" instead of a specific total.

Reports of abuse, neglect or financial exploitation for seniors in long term care facilities

This figure records the number of allegations of patient abuse, neglect or financial exploitation that occur in long term care facilities, are reported to the Ohio Department of Health and are referred to the Ohio Attorney General's Medicaid Fraud Control Unit.

By federal law, all long term care facilities that receive Medicaid funding (i.e., virtually all) must report any allegations of abuse, neglect or exploitation to the licensing agency in their state. In Ohio, the Ohio Department of Health (ODH) is the relevant agency. Each year, ODH receives about 16,000 such "self-reported incidents" (SRIs), about 4,900 of which identify a staff member or a family member or visitor as the perpetrator and so are consistent with our conceptual definition of elder abuse. ODH reviews all SRI's and refers about 2,300 each year to the Ohio Attorney General's Medicaid Fraud Control Unit (MFCU) for further investigation. The data presented in this study are limited to the SRIs that are referred to the MFCU. The figures come from unpublished spreadsheets covering 2010 to 2012.[56]

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[53] Pillemer K, Moore DW. Abuse of patients in nursing homes: findings from a survey of staff *Gerontologist*. 1989; 29:314A-320A.

[54] Data provided by Bill Robbins, Bureau of Information and Operational Support, Ohio Department of Health. Based on data from the Center for Medicare & Medicaid Studies, Minimum Data Set 2.0, 2009.

[55] Mehdizadeh S, Applebaum R, Nelson IM, Straker J, Deacon M. *Maybe Elephants Can Dance: Two Decades of Progress in Delivering Long-Term Services and Supports in Ohio*. Oxford, OH: Scripps Gerontology Center, Miami University; 2013.

[56] Thanks to Christy Haenszel, Medicaid Fraud Control Unit, Ohio Attorney General's Office. Also, Jill Shonk and Brian Dean at the Ohio Department of Health's Division of Quality Assurance provided assistance understanding the data.

All SRIs referred to MFCU are reviewed, but only some result in a formal case investigation. Although a few SRIs referred to MFCU are based on bogus accusations, the greatest barrier is lack of evidence. Many victims are cognitively impaired yet are the only direct witnesses to acts of abuse, neglect or exploitation. In addition, by the time a case is reviewed, the alleged perpetrator may have left her/his job and relocated outside the state, the patient may have died, and/or other witnesses may have become unreachable.

These data largely (but not completely) overlap with allegations reported to the Ohio Department of Aging's Office of the Long Term Care Ombudsman. SRIs referred to MFCU do not include instances involving other patients or family members as perpetrators. Rather, these SRIs are limited to allegations of abuse, neglect and exploitation perpetrated by facility staff.

To provide more stable counts for each county, the county profiles report the three-year average of the annual number of referred SRIs for 2010 through 2012. Nonetheless, some counties had too few cases over three years (<10) to calculate a reliable rate. We suppressed rates for these counties, listed below in Table 4.

To calculate a rate, we divided the number of reports (i.e., SRIs) by the number of resident beds.[54] Because we were unable to distinguish reports based on victim's age or the facility in which the incident occurred, we did not adjust the rate denominator to account for vacant resident beds or for victims under 60 years old. To the extent that certain counties have an unusually high vacancy rate or a large proportion of residents under 60 years old, our figures may be biased.

Because SRI referrals are recorded in a similar manner across Ohio, they can be useful for making some comparisons across counties. To limit the degree to which apparent differences are due to counties' demographic differences, we created five groups of reference counties for comparing the 71 counties with sufficient 2010-2012 data (i.e., excluding those in Table 4).

Table 4. Counties with < 10 cumulative reported incidents of abuse, neglect or exploitation that occurred in long term care facilities and were referred to the Ohio Medicaid Fraud Control Unit, 2010-12.

County	# of cumulative referrals	County	# of cumulative referrals
Athens	7	Morrow	7
Carroll	0	Noble	<10*
Coshocton	2	Paulding	1
Henry	6	Pike	1
Hocking	6	Preble	7
Holmes	8	Van Wert	6
Logan	3	Vinton	6
Monroe	5	Wyandot	2
Morgan	6		

** To avoid singling out the one facility in Noble County out, we only report the number of SRIs as "<10."*

We chose to not compare rates in individual counties over time because of the overall marked decline in reports for nearly all counties. Overall, for example, the number of SRI's declined from 2010 to 2011 to 2012 respectively from 3,124 to 2,285 to 1,724. Only 8 small counties had any increase in the raw number of reports during this period. The reason for the decline is

uncertain. One possible explanation is the growing unwillingness of long term care facilities to report SRIs. Many facilities increasingly feel that the disruption and harm associated with investigating SRIs outweighs the harm of not complying with mandatory reporting requirements.

SOURCES AND METHODS FOR OTHER HEALTH ISSUES

To compare the prevalence of family violence to other health issues, we used the following sources and methods.

Current cigarette use (teenage females, 15-19)

We developed this estimate by interpolating prevalence rates from the 2013 Ohio Youth Risk Behavior Survey (YRBS).[21] The YRBS is conducted by the Ohio Department of Health and the Centers for Disease Control and Prevention every two years, and is a well-regarded measure of the prevalence of different risk behaviors for youth enrolled in grades 9-12. Our estimate of current cigarette use is based on the percentage of students who reported smoking cigarettes on 1 or more days during the 30 days before the survey.

The data do not include youth in prison or those who have dropped out. Cigarette use is more common among youth excluded from the YRBS sample, so our figures probably underestimate the true prevalence of cigarette use among all youth. Nonetheless, these estimates are still the most complete and recent available.

According to the 2013 YRBS, 13.38% of Ohio females in grades 9-12 currently smoke cigarettes (95% confidence interval, 10.51% - 16.89%). Because YRBS estimates are for 9th through 12th graders, it was necessary to adjust them to be consistent with our age group of 15-19 year old females. Because there were no significant differences by grade, we simply applied the overall prevalence estimate to the entire age group.

Because YRBS data are not available for individual counties in Ohio in 2013, we used this statewide rate for each county. Nonetheless, certain regions of the state may have higher or lower rates of cigarette use among females. Appalachian counties, for example, tend to have higher rates of youth smoking than do other areas of the country.[57] Because our county-specific estimates did not adjust for these differences, each county's estimate should be interpreted as only an approximation of the true number of teenage girls who are cigarette users.

Pregnancies (teenage females, 15-19)

Mean number of pregnancies among females 15-19 years old per year by county, 2008, 2009 and 2010, as tallied by the Ohio Department of Health.[58] This figure includes live births, induced abortions and estimated fetal losses.

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[57] Zhang Z, Infante A, Meit M, English N, Dunn M, Bowers KH. *An Analysis of Mental Health and Substance Abuse Disparities & Access to Treatment Services in the Appalachian Region*. Washington, DC: Appalachian Regional Commission and the National Opinion Research Center; 2008. Available: http://www.kentucky.com/static/pdfs/ARCreport.pdf

[58] Ohio Department of Health. Teen Pregnancy Counts and Rates by Age and Year. Columbus, OH: Author; June 12, 2012. Available: http://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/health%20statistics%20-%20vital%20stats/Copy%20of%203%20teenpregnancy2010.ashx

Injuries in motor vehicle crashes (teenage females, 15-19; women, 18-64; seniors, 60+)

This figure includes both fatal and nonfatal injuries to drivers, passengers and pedestrians. County refers to where the injury occurred, not the residence of the injured person. We computed these figures by calculating the annual averages for 2010, 2011 and 2012 based on data published by the Ohio Department of Public Safety.[59] Demographic data were available at the state level, but only overall tallies at the county level. We estimated the number of injuries to specific age/sex groups at the county level by applying the corresponding statewide proportions. For example, people 60+ years old accounted for 13.51% of injuries statewide, so we estimate that of the average annual number of 303 injuries in Adams County, (13.51% * 303=) 41 were among this population. We omitted from our figures the small number of injuries (n=744 or <0.03%) for which the victim's age and/or sex were unstated.

New cancer cases (children, 0-17; women, 18-64; seniors, 60+)

This number is the average annual number of invasive cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) during 2009 through 2011 (the most recent years for which data are publicly available).[60] It counts the number of cases, not the number of persons; one person may be diagnosed with more than one primary tumor (e.g. Melanoma of Skin and Lung & Bronchus) and therefore be counted as more than one case.

This figure represents the average number of all cancer cases (all types combined) that are newly diagnosed each year. The age groups available in this data set differ slightly from those used in the present study, so figures for children are actually for 0-19 year olds and figures for adult women are for those 20-64 years old. These discrepancies have little effect on the overall incidence figures.

Injuries from falls that result in a trip to an emergency department (seniors, 60+)

We based this estimate on fatal and nonfatal injury data from the National Center for Injury Prevention and Control.[61] Data from nonfatal injuries are from the National Electronic Injury Surveillance System-All Injury Program and are based on a representative sample of 66 emergency departments around the country. From 2004 through 2010, among seniors 60+ years old, 4.44% visited an emergency department each year for a nonfatal injury resulting from a fall. In addition, data from annual mortality files at the National Center for Health Statistics indicated that during these years the annual rate of fatal injuries from falls in this age group nationwide was 36.53 per 100,000. In other words, during this period in this age group, there were about 8.24 fatal falls for every 1,000 falls that resulted in an emergency department visit. This ratio varied little from year to year.

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[59] Ohio Department of Public Safety. *Ohio Traffic Crash Facts 1/1/2012 to 12/31/2012*. Columbus, OH: Author, October 15, 2013. Available: http://ohiohighwaysafetyoffice.ohio.gov/otso_annual_crash_facts.stm

[60] Ohio Department of Health. Ohio Public Health Data Warehouse. Cancer Incidence Data (1996-2011) online database (Cancer [Invasive] Site/Type by Age Group; All types; 2009-2011; [age group]). Available: http://publicapps.odh.ohio.gov/EDW/DataBrowser/Browse/StateLayoutLockdownCancers .

[61] Centers for Disease Control and Prevention, *National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS)* [online]. (2005). Available www.cdc.gov/injury/wisqars

During this same period, we used mortality files to tally the number and rate of fatal falls in this age group for 53 of Ohio's 88 counties. Using the 8.24/1000 ratio described above, we then back-estimated the number of non-fatal falls in each of these counties. For the 35 counties with too few cases to be included, we imputed the statewide mean to estimate the number of fatal and non-fatal falls in this age group.[62] We then totaled the number of fatal and non-fatal falls to create an estimate of the number of falls resulting in an emergency department visit. While not all fatal falls result in an emergency department visit, some medical personnel are always involved. For the sake of clarity we chose to use this language to describe the measure.

This approach enables our estimates to account for regional variation in the rate of seniors' injuries from falls. Nonetheless, it relies on an unproven assumption, that the ratio of fatal to nonfatal injuries from falls is consistent across the state.

ACKNOWLEDGEMENTS

Many people provided their time, patience and advice to help us access and understand the data. Many practitioners, researchers, and agency officials – too numerous to thank here – reviewed this document and our work. Also, Thalia Farietta helped with everything from tracking down data to the tedious tasks of cleaning and organizing spreadsheets. Finally, the OFVPP Working Group (listed below) offered suggestions, encouragement and tangible support throughout the process. Thank you!

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Suggested citation:
Ohio Colleges of Medicine Government Resource Center. *The Scope of Family Violence in Ohio: Sources and Methods*. Columbus, OH: Author; 2014.

[62] Whereas the Ohio annual mean of fatal injuries from falls among seniors 60+ was 38.20 per 100,000, we adjusted this to account for the counties for which we had data. The corrected mean was 35.50 per 100,000.