

Ohio Family Violence County Profiles: Sources and Methods

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INTRODUCTION

This document details the sources and methods used for compiling findings for the Ohio Family Violence County Profiles. 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 our 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, its consequences 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 abuse and neglect:** 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 because it does not require interpersonal interaction it is beyond the scope of our work. 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 chose to focus on them because of the paucity of research on other types (e.g., neglect of non-elderly disabled adults).

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. Available: <http://www.healthpolicyohio.org/publications/OhioFamilyViolence.html>

What should I know about 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 **2007**. In epidemiologic terms, these figures are “annual prevalence estimates,” or more technically “period prevalence estimates, where the focal point is one year.” Also, the **figures refer to the number of victims of violence, not the number of perpetrators**. When presenting estimates, we **round numbers** to the nearest 100. Where figures are less than 1000, we round estimates to the nearest 10, or “<5” as appropriate.

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 civil protection order may seek protection for multiple individuals (e.g., a mother and her children) as protected parties. We try to report unduplicated counts whenever possible, yet often these data are unavailable. For most agency findings, we took the annual mean across multiple years (e.g., 2006, 2007 and 2008) 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.

How should I use findings from the county profiles?

The county profiles are designed to help local stakeholders understand and communicate the scope of family violence in their community. They are designed to help with grant writing and public education, rather than for program planning or evaluation.

Some findings are presented as a range (see explanation, below). The following statements are some examples of appropriate ways to quote findings presented in a range:²

- “...a recent study found that **between 8,400 and 11,000 women** experience physical intimate partner violence in our county each year.”
- “...a recent study found that **at least 8,400 women** experience physical intimate partner violence in our county each year.”
- “...a recent study found that **as many as 11,000 women** experience physical intimate partner violence in our county each year.”

Data from the county profile may also be useful to highlight specific themes, including:

² These estimates are from Franklin County. Be sure to use the correct figures for your county.

Prevalence vs. incidence

Terms like “prevalence” and “incidence” are often used interchangeably in newspapers and 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 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.

- **each year, many victims of family violence never come to the attention of authorities;**
“According to a recent study, ___ elders are abused or neglected each year in our county, yet the local adult protective service only received ___ reports.”
- **family violence places a tremendous burden on social service agencies;**
“Since 2000, the number of petitions for civil protection orders jumped from ___ to ___.”
- **certain types of family violence are every bit as common as other, more widely recognized threats to health and well-being.**
“One recent study estimated that each year in our county, at least ___ teenage girls experience dating violence, compared to ___ who are injured in motor vehicle crashes. “

The findings in the county profiles are **not intended to be used for program planning or evaluation**. Readers who are interested in using the data this way are encouraged to contact us for assistance.

How accurate are these 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 dozens of researchers and practitioners. In general, they are also internally consistent. Assuming that the vast majority of family violence incidents do not come to the attention of authorities, our figures from service agencies (e.g., children in custody; reports to adult protective services) 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 very difficult. Many victims are isolated, afraid or ashamed 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 to producing accurate figures is finding data to match our conceptual definition of family violence. 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. Moreover, emotional abuse is often not illegal, so police and other social services have limited authority to intervene. As a result, service reports are especially likely to undercount individuals experiencing emotional, but not other types of abuse.

Another challenge in producing accurate estimates involves the need to rely on assumptions that are difficult or impossible to test empirically. 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.

To reflect this uncertainty, **we present each underlying prevalence estimate as a range** (e.g., 3,900 to 4,900 children abused or neglected) rather than as a single, precise number. In general, we err on the side of caution so **our estimates are conservative**.

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 Ohio Family Violence Prevention Project so we can investigate and correct it. In addition, we welcome suggestions on how to improve our work.

Can I compare counties?

It is tempting to compare figures for different counties, as putting data in context can make a compelling case for action. Yet for most data sources, county comparisons are inappropriate. Most apparent county-level differences in the family violence county profiles are due to four related factors:

- (1) Underlying prevalence – while family violence is a serious concern in all communities, many studies have found that its underlying prevalence can differ by region.
- (2) Demographic characteristics – regional differences in family violence are often associated with characteristics like the population’s age distribution and poverty level.
- (3) Organizational capacity – agencies with more staff and better community relations may elicit more reports of abuse and neglect.
- (4) 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 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 to counties’ demographic differences, we created five groups of counties for making more appropriate comparisons. These groups are presented in Table 1 (see p. 7).

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.

For findings not based on agency reports, we have other concerns about comparing counties. Our estimates of the true extent of family violence – (A), (D), (H) (I) and (M) – 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.

Table 1. Groups of Ohio counties

Major metropolitan (6)	Suburban (18)	Smaller metropolitan (7)	Appalachian (29)		Non-Appalachian rural (28)	
Cuyahoga	Butler	Allen	Adams	Jefferson	Ashland	Logan
Franklin	Delaware	Clark	Athens	Lawrence	Ashtabula	Mercer
Hamilton	Fairfield	Erie	Belmont	Meigs	Auglaize	Morrow
Lucas	Fulton	Mahoning	Brown	Monroe	Champaign	Ottawa
Montgomery	Geauga	Marion	Carroll	Morgan	Clinton	Paulding
Summit	Greene	Richland	Clermont	Muskingum	Crawford	Preble
	Lake	Stark	Columbiana	Noble	Darke	Putnam
	Licking		Coshocton	Perry	Defiance	Sandusky
	Lorain		Gallia	Pike	Fayette	Seneca
	Madison		Guernsey	Ross	Hancock	Shelby
	Medina		Harrison	Scioto	Hardin	Van Wert
	Miami		Highland	Tuscarawas	Henry	Wayne
	Pickaway		Hocking	Vinton	Huron	Williams
	Portage		Holmes	Washington	Knox	Wyandot
	Trumbull		Jackson			
	Union					
	Warren					
	Wood					

When are differences noteworthy?

When comparing quantitative data, **apparent differences are often just due to chance**. Let us say one county had 86 petitions for civil protection orders (CPO's) in 2007 but only 65 in 2008. Clearly, the number decreased, but is the decrease more than we might expect from chance? After all, it is unreasonable to expect that there will be exactly 86 petitions for CPO's each year. If we make some reasonable assumptions, then we can calculate a *confidence interval* that is bounded by upper and lower confidence limits for each year.³ Beyond this range of values, we may be very (i.e., 95%) confident that yearly fluctuations are not only due to chance. For 2007, for example, we can calculate:

$$[\# \text{ of CPO's}] + 1.96\sqrt{[\# \text{ CPO's}]} = 86 + 1.96 \sqrt{86} = 104.2 = \text{upper confidence limit}$$

$$[\# \text{ of CPO's}] - 1.96\sqrt{[\# \text{ CPO's}]} = 86 - 1.96 \sqrt{86} = 67.8 = \text{lower confidence limit}$$

In other words, we cannot be confident that yearly fluctuations between 67.8 and 104.2 petitions for CPO's in the county are not simply due to chance. In comparison, in 2008, the lower and upper confidence limits were 49.2 and 80.8 respectively. Because the confidence intervals of the two periods overlap (i.e., $67.8 < 80.8$), we cannot be very (95%) confident that the difference from 2007 to 2008 is not simply due to chance. So we conclude that there is no noteworthy change in the number of petitions for CPO's.

We used a similar approach in the section "How do we compare to other counties?" Because counties vary a lot by population, we compared rates rather than numbers. In Montgomery County from 2006-2008, for example, there were 33.8 CPO petitions per 10,000 adults, with a 95% confidence interval between 32.0 and 35.6. To compare Montgomery County to similar counties, we took the mean rate of CPO petitions for all 6 of Ohio's major metropolitan counties (see Table 1, p. 7). Using the formula above,⁴ we calculated the overall rate for these counties as 25.9 per 10,000, with a 95% confidence interval between 25.3 and 26.5. Because these confidence intervals did not overlap (i.e., $26.5 < 32.0$), we concluded that Montgomery County had a higher rate of CPO petitions that was not simply due to chance. In the interest of space, on the county profiles we do not present the confidence intervals for these rates.

In the section "*Is Family Violence Increasing?*" we also use this procedure to determine if CPO petition rates have changed across three consecutive three-year periods. The confidence intervals for each period are marked by vertical lines.

Rates in less populous counties are often based on few cases, so the confidence intervals is quite large, making it difficult to conclude that the differences are not due to chance. 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."

³ Most introductory statistics textbooks will provide a more thorough discussion of confidence intervals.

⁴ Actually, we used a slight variation on this formula. We computed confidence intervals for the number of petitions, and then converted the upper and lower confidence limits to rates.

SOURCES AND METHODS FOR SPECIFIC FINDINGS




The key below identifies the 18 findings – (A) through (R) – that we present on each county profile. Use the reference letter to look up the appropriate page number (see table of contents, p. 2).

Family Violence in Franklin County

These data describe common types of violence perpetrated by family members or caregivers in our county each year. We present the best available, most recent estimates. Nonetheless, our figures are conservative and represent only part of the burden family violence places on our families and communities. All figures are estimates or annual averages.

Each year in our county...

<p>3,900 (A) children are abused or neglected</p> <p>(B) reports of abuse or neglect are filed with children's services</p> <p>6,337 (C) children are placed in custody</p>	<p>8,400 (D) adults are physically abused by a current or former intimate partner</p> <p>(E) people are arrested for intimate partner violence</p> <p>(F) people file petitions for civil protection orders</p> <p>(G) adults seek shelter in domestic violence shelters in the county</p>	<p>6,700 (H) seniors in the community are abused, neglected or financially exploited</p> <p>250 (I) seniors in LTC facilities are abused, neglected or financially exploited</p> <p>(J) reports of abuse, neglect or exploitation are filed for seniors in the community</p> <p>(K) reports of abuse, neglect or exploitation are filed for seniors in LTC facilities</p>
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- It is difficult to measure the true prevalence of family violence; many victims never come to the attention of authorities.
- Reports to local children's service agencies typically exceed the estimated number of abused or neglected children. This is likely due to multiple reports filed for a single child. Also, many children are placed in custody for reasons other than abuse/neglect (e.g., delinquency).
- Elder abuse/neglect figures exclude self-neglect and victims <60 years old. (LTC = long term care)

This profile is part of an 88-county series provided by the Ohio Family Violence Prevention Project – a collaborative project of the Ohio State University College of Public Health and the Health Policy Institute of Ohio with support from the HealthPath Foundation of Ohio. For definitions and a detailed description of how we calculated these figures, see: Sources and Methods for Ohio Family Violence County Profiles. Available: [insert URL].
 Suggested citation: Ohio Family Violence Prevention Project. *Family Violence in [county name] County*. Columbus, OH: Health Policy Institute of Ohio; 2010.

In Franklin County, how does family violence compare to other threats among ...?

teenage girls (age 15-19, est. #/year)	adult women (age 18+, est. #/year)	seniors (age 60+, est. #/year)
<p>physical intimate partner violence (L) 6,700-11,800</p> <p>motor vehicle injuries (M) 3,200-4,900</p> <p>injuries to teenagers (N) 1,795</p> <p>motor vehicle injuries (O) 775</p>	<p>physical intimate partner violence (D) 5,500-7,400</p> <p>motor vehicle injuries (O) 6,075</p> <p>mothers without foster care (P) 5,953</p> <p>new cancer cases (Q) 2,584</p>	<p>elder neglect (H) 6,700-8,500</p> <p>injuries from falls in hospital (R) 5,500-7,600</p> <p>elder abuse cases (Q) 2,955</p> <p>motor vehicle injuries (O) 1,197</p>

• For example: each year in our county between 5,500 and 7,400 adult women experience physical intimate partner violence; in comparison, 6,075 adult women are injured in motor vehicle crashes.

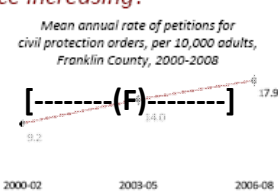
How do we compare to other counties?

	Franklin County	Mean of 6 major metro counties	State mean
Civil protection order petitions (per 10,000 adults)	1.0	1.5	2.1
Reports of abuse, neglect or exploitation in LTC facilities (per 100 resident beds)	6.1	4.9	3.3

- Franklin County has a lower rate of petitions for civil protection orders (CPO's) compared to similar counties in Ohio.
- Franklin County has about the same rate of reports of abuse, neglect or exploitation in LTC facilities compared to similar counties in Ohio.
- Differences in data collection limit our ability to compare other indicators of family violence across counties.

Is family violence increasing?

It is hard to say. Some data sources suggest family violence is increasing; others suggest it is stable or decreasing. Within a county, changes over time are largely due to changes in victims' ability to access services. This graph suggests a significant increase in petitions for CPO's in our county. This trend could reflect a growing awareness or ability of victims to request CPO's. For a discussion of when differences are noteworthy, please see the introduction.



Mean annual rate of petitions for civil protection orders, per 10,000 adults, Franklin County, 2000-2008

To talk with someone about family violence, contact:

Child Abuse Hotline: 1-800-4-A-CHILD
 Ohio Domestic Violence Network 1-800-934-9840
 Ohio Area Agencies on Aging: 1-866-243-5678

Population estimates

To calculate rates, we relied on population data for each county from the US Census Bureau's annual American Community Survey (ACS).⁵ For some age groups, we needed to create population estimates that were not available each year. During intercensal years, for example, the ACS only reports population estimates for residents 65 and older, not for those 60 and older. We used the following procedures to construct estimates for specific demographic groups.

Residents 60+ years old. To estimate the size of this group, we needed to add our estimate for 60-64 year olds to the reported figures for residents 65+ years old. Using the figures for residents 60-64 year olds from the 2000 Census as base estimates,⁶ we applied annual population change figures for 45-64 year olds for each county to estimate the number of 60-64 year olds in each county in each year. For example, the 2000 Census counted 24,504 individuals 45-64 years old in Allen County in 2000, including 4,274 people 60-64 years old. The 2001 census estimates projected that the number of 45-64 year olds in the county increased 2.49%. Thus, we estimated the population of 60-64 years olds in Allen County in 2001 as $(4,274 * [1+0.0249]=) 4,380$. Adding this figure to the US Census Bureau's estimate of the number of people 65+ in Allen County in 2001 (i.e., 15,195), we arrived at our estimate of $(4,380+15,195=) 19,575$. We continued this procedure each year through 2008.

Females 15-19 years old. Using the figures for 15-19 year old females from the 2000 Census as base estimates, we applied annual population change figures for 14-17 year old females for each county to estimate the number of 15-19 year olds in each county in each year. For example, the 2000 Census found 1,002 15-19 year old females in Adams County. Annual population change estimates for 2001 found that the population of 14-17 year old females in the county had changed -4.94% from 2000. Thus, we estimated the population of 15-19 years olds in Adams County in 2001 as $(1,002*[1-.0494]=) 952$ females. We continued this procedure through 2007.

Although these calculations are not precise, they are adequate for our purposes. Because our prevalence rates are relatively small, differences between the estimated and actual population has little if any influence on figures for each county.

(A) Children abused and/or neglected (estimate)

We derived our estimate by interpolating national data from the *Fourth National Incidence Study of Child Abuse and Neglect (NIS-4)*.⁶ NIS-4 reported a point estimate of 17.065 cases per 1,000 children with a standard error of 1.732. We converted this to a range of between 13.670 and 20.460 per 1,000 children.

Rather than count only those cases that are formally substantiated by child protective services (CPS), the NIS-4 is a sentinel surveillance study 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. 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

⁵ US Census Bureau. *2008 American Community Survey population estimates by age and sex*. Available: <http://www.census.gov/popest/counties/asrh/files/CC-EST2008-agesex.pdf>

⁶ 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.

well as those who are not. *Nonetheless, it does not count abused and neglected children who do not come to the attention of community professionals.*

While the NIS-4 was published recently and is arguably the gold-standard estimate for the prevalence of child abuse and neglect, the data on which it is based were collected in 2005-6. Since then, Ohio has experienced profound economic distress. Because economic measures like unemployment are strongly associated with child maltreatment, the underlying prevalence of child abuse and neglect may be considerably higher.

By interpolating national data, we assume that Ohio resembles the nation as a whole in terms of the scope of child abuse and neglect. Although researchers have documented significant community-level variation in child maltreatment,⁷ such an assumption is not unreasonable. Ohio is close to the national average in terms of several community level factors associated with child maltreatment, including poverty and family structure. One foundation recently ranked Ohio 28th out of 50 states for overall child well-being.⁸

Within Ohio, however, counties vary considerably in their levels of poverty and other community level factors associated with child maltreatment. Nonetheless, without a clear method for adjusting rates for each county, we apply our estimated ranges to the 2007 population children < 18 in each county. *As such, county-specific estimates should be interpreted as only an approximation of the true number of abused and/or neglected children in each county.*

(B) 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 2007. 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.

Our figures include all reports, whether or not they are substantiated or indicated.⁹ Under Ohio law, all allegations of child abuse or neglect must be investigated within 24 hours. In 2007, 41,449 of 106,538 investigated reports (39%) received a disposition of “substantiated” or “indicated.”¹⁰ 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

⁷ Coulton CJ, Korbin JE, Su M, Chow J. Community level factors and child maltreatment rates. *Child Development*, 1995;66:1262-1276.

⁸ Annie E Casey Foundation. *2009 KIDS COUNT Data Book*. Available: <http://www.kidscount.org>

⁹ “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.

¹⁰ U.S. Department of Health and Human Services, Administration on Children, Youth and Families. *Child Maltreatment 2006*. Washington, DC: U.S. Government Printing Office; 2008.

spreadsheet prepared by ODJFS for the Public Children Services Association of Ohio (PCSAO). The data are identical to those reported in the *PCSAO Factbook, 9th Edition, 2009-10*.¹¹

As of 2007, many counties were using the new Statewide Automated Child Welfare Information System (SACWIS) to record and track reports of child abuse and neglect. Often this new system prompted significant changes in how county agencies report to ODJFS. Because some counties had begun using SACWIS whereas others had not, comparing county rates during this year can yield misleading conclusions. Even within a county, comparing 2007 to earlier or later years may be misleading, depending on when the county began using the SACWIS system. By 2008, all counties were using the new system, so future comparisons may be more useful.

(C) Children in custody

This figure represents the number of children removed from their homes and placed in state custody during 2007. This figure 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, 9th Edition, 2009-10*.¹²

(D) Adults/Women experiencing intimate partner violence (estimate)

This measure is based on data from the 2008 Ohio Family Health Survey (OFHS) – a telephone survey of 50,944 adults in Ohio.¹² 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 1.55% (95% confidence interval, 1.27%-1.72%) among women 18+ and 1.15% (95% confidence interval, 1.01%-1.32%) for all adults 18+. We tried to compute county-specific estimates, however, insufficient sample size yielded unreliable estimates (relative standard error >.30) for nearly all counties. Because analyses found no significant difference by county or region, we used the statewide prevalence estimates for

¹¹ Public Children Services Association of Ohio. *The Child Protection Mission: Safe Children, Stable Families & Strong Communities, (PCSAO Factbook, 2009-10), 9th Edition*. Columbus, OH: Public Children Services Association of Ohio, 2009. Available: <http://www.pcsao.org/pcsaoofactbook.htm>

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: http://ckm.osu.edu/sitetool/sites/ofhspublic/documents/OFHS_Report_Steinman.pdf

most counties. Our estimate is similar to those reported in similar national studies.^{13,14} We multiplied the observed rate against 2007 population estimates from the US Census Bureau.⁶ Like all findings from survey samples, our estimates are an approximation.

(E) Arrests for intimate partner violence (estimate)

This figure is based on monthly tallies during the 2007 calendar year for domestic disturbance calls recorded by local law enforcement agencies and reported to the Attorney General's Office's Bureau of Criminal Identification (BCI).¹⁵ According to Ohio law (ORC 3113.32), every law enforcement agency in the state must submit monthly reports to BCI that record the nature and disposition of all domestic disturbance calls. Each law enforcement agency reports the number of domestic violence incident (DVI) arrests, domestic disturbance calls that resulted in an arrest on non-domestic-violence-related charges (e.g., drug possession) and domestic disturbance calls that resulted in no charges.

In 2007, 50% of Ohio's law enforcement agencies submitted reports for all 12 months, and an additional 28% of agencies submitted reports for 4-11 months of the year. For agencies with incomplete (i.e., 4-11 months of) data, we extrapolated their tallies for the entire calendar year. For example, an agency that reported 10 DVI arrests over 6 months, we estimated would have recorded 20 for the entire year. This assumption was not unreasonable, because we detected little seasonality in the data. (Agencies that reported <4 months of data we determined were inadequate to interpolate figures for an entire year.)

Of the different reported measures, we were particularly skeptical of the tallies for "total calls." Different agencies likely have different policies and procedures for when to record a domestic disturbance call in the BCI data. Each year, for example, the Columbus Police Department reports about 3,200 such calls to BCI. Analyses of call logs from their radio room, however, suggest that officers make 80,000 to 90,000 such calls per year.¹⁶

We decided that records of DVI arrests may be more reliable, assuming that officers are more likely to report and record an incident that results in an arrest. Overall, 36,465 of the 76,760 (48%) domestic disturbance calls that law enforcement reported to BCI in 2007 resulted in a DVI arrest.¹⁷ Not all of these arrests, however, were for intimate partner violence. Overall, 57% of all calls reported to BCI involved a current or former "intimate partner" relationship between victim and offender (i.e., spouse,

¹³ 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.

¹⁴ 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> .

¹⁵ Ohio Attorney General's Office, Bureau of Criminal Identification. *Domestic Violence Incidents by County and Agency, 2007*. Columbus, OH: Ohio Attorney General's Office.

¹⁶ Personal communication to Kenneth Steinman, Commander Kim Jacobs, Columbus Police Department, October 7, 2009.

¹⁷ Ohio Attorney General's Office, Bureau of Criminal Identification. *Domestic Violence Incident Calls, 2007*. Columbus, OH: Ohio Attorney General's Office.

former spouse, live-in partner, non-spousal relationship with child involved),¹⁸ although the proportion varied by county. Other disturbances involved parents, children or “other family members.”¹⁹

To estimate the number of arrests related to intimate partner violence, we multiplied the total number of DVI arrests by the proportion of calls in that county that explicitly involved intimate partners. In Franklin County, for example, our imputed total number of DVI arrests was 4,331, while 4,061 of the 6,299 calls (64%) that recorded a relationship between victim and perpetrators were among intimate partners. Thus, we estimated that police made $(4,331 * 0.64 =)$ 2,772 arrests related to intimate partner violence in Franklin County in 2007.²⁰ Because many perpetrators of intimate partner violence are arrested multiple time during a year, our figures should not be confused with a count of unduplicated individuals. Nonetheless, each arrest represents a separate serious violent incident that uses scarce agency resources.

This assumes that domestic disturbance calls involving intimate partners are similarly likely to result in arrest compared to calls involving other household members. Previous research suggests the likelihood of arrest may be slightly higher for domestic violence involving intimate partners compared to other victim-offender relationships (e.g., siblings),²¹ so this figure may be too conservative.

Many counties had too many agencies with missing data to calculate a reliable total. In summary we estimated county-level figures for 67 counties that met the following criteria: (1) the county sheriff’s office provided adequate (i.e., 4-12 months’) data; and (2) the remaining law enforcement agencies in the county with adequate data covered at least 75% of the county’s population. We present unadjusted totals for these counties, so our figures will underestimate the true total in counties with more agencies missing data. For the 21 counties that did not meet the inclusion criteria, we suppressed the arrest estimates because they were incomplete. Table E1 lists the counties with suppressed arrest estimates.

¹⁸ Ohio Attorney General’s Office, Bureau of Criminal Identification. *Domestic Violence Victims Summary Report, 2007*. Columbus, OH: Ohio Attorney General’s Office.

¹⁹ The 57% figure excludes the 12% of calls in which the relationship between victim and offender is described as “other.” A large, but unknown proportion of these calls involve disturbances between boyfriends and girlfriends (personal communication to Kenneth Steinman, Joann Taylor, Bureau of Criminal Identification, February 2, 2009).

²⁰ In Hamilton county, an unusually large proportion of calls recorded the offender-victim relationship as “other” (60% compared to 12% statewide). As a result, estimates of IPV arrests in Hamilton county appear much lower than expected. We suspect that this difference mostly reflects reporting differences among agencies and not differences in practice.

²¹ Hirschel D, Buzawa E, Pattavina A, Faggiani D. Domestic violence and mandatory arrest laws: To what extent do they influence police arrest decisions? *Journal of Criminal Law & Criminology*, 2008;98:255-298.

Table E1. List of 23 Ohio counties with inadequate data to calculate estimated # of domestic violence incident arrests from 2007 Bureau of Criminal Investigation (BCI) data.

county	county sheriff has 4+ months of BCI data	% of county residents living in jurisdictions with adequate BCI data
Adams	Yes	72%
Belmont	yes	50%
Brown	no	94%
Champaign	yes	71%
Clermont	yes	67%
Coshocton	yes	68%
Hardin	no	48%
Harrison	no	21%
Lake	no	77%
Lawrence	yes	74%
Logan	no	27%
Mahoning	yes	64%
Meigs	yes	72%
Muskingum	yes	67%
Noble	no	0%
Ottawa	yes	67%
Richland	yes	61%
Ross	no	32%
Scioto	no	26%
Seneca	yes	68%
Tuscarawas	no	85%
Van Wert	yes	53%
Wyandot	yes	71%

Notes: To have adequate BCI data in 2007, a county's sheriff's office has to submit ≥ 4 monthly reports and $\geq 75\%$ of county residents had to live in jurisdictions that submitted ≥ 4 monthly reports.

In 2007, 95% of Cuyahoga County's population lived in jurisdictions that submitted ≥ 4 monthly reports, but the sheriff's office did not submit any reports. Because the Cuyahoga County Sheriff's Office has no road patrol, we included the county in reported data.

(F) New petitions for civil protection orders

Based on data gathered by the Supreme Court of Ohio,²² this figure represents the number of petitions for civil protection order (CPO) related to domestic violence (pursuant to ORC 3113.31) that are filed with the Clerk of the Court in each county's Court of Common Pleas. These include all petitions, regardless of whether is CPO is actually issued or what happens subsequently. A petitioner can seek protection for multiple people on each petition (e.g., a mother and her children) and it is possible for a victim to file more than one petition in a year.

²² Supreme Court of Ohio (2009). *Domestic Violence Overall Caseloads*. Available: <http://www.supremecourt.ohio.gov/JCS/domesticViolence/resources/OverallCaseloadsDataOCS.xls>

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 request a Stalking or Sexually Oriented Offense Protection Order instead of a CPO, even if the perpetrator is a family or household member. Others may seek a Temporary Protection Order in Criminal Court. Neither of these petitions are included in our tallies of CPO's.

To create more reliable estimates, we calculated annual averages for 3 different 3-year periods: 2000-2002, 2003-2005 and 2006-2008 and calculated rates per 10,000 adults. As a denominator for each 3-year period, we used the entire adult county population (i.e., over age 18 years) for the middle year (i.e., 2001, 2004, 2007). For counties that reported <20 petitions during a three-year period, we suppressed rates as being unreliable. Table F1 lists the number of counties with suppressed rates for each period.

Table F1. Counties with < 20 new petitions for civil protection orders during 3 three-year periods.

<u>County</u>	<u>2000-02</u>	<u>2003-05</u>	<u>2006-08</u>
Harrison		11	
Knox	2	1	0
Monroe	14		
Morgan	2	3	
Noble	7		
Paulding	19	9	10

Note: Blank cells indicate >20 petitions for civil protection orders were filed during that period.

Because CPO petitions are recorded in a relatively similar manner across Ohio, they can be useful for making some limited 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 86 counties with sufficient 2006-2008 data (i.e., excluding Knox and Paulding; see Table F1). These groups are listed above in Table 1 (p. 7).

(G) Adults sheltered in domestic violence shelters

This figure is based on unpublished data provided by the Ohio Attorney General's Office. Using data from 2007 and 2008, we reported the average number of adults sheltered each year. If a shelter was missing data for one year, we used the figure for the available year. This figure represents all adults sheltered at domestic violence shelters in the county, regardless of victims' actual county of residence. For counties that have no shelter services available, we note that residents use shelters in other counties.

(H) Seniors in the community who are abused, neglected, or financially exploited (estimate)

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,²³ a recent nationally representative

²³ 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.

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 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) via email,²⁴ 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 research 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.”²⁵ (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.²⁶ In summary, our estimate appears to be in line with 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 section (I), 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 2007 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.

²⁴ Personal communication to Kenneth Steinman by Ron Acierno, Medical University of South Carolina, March 15, 2010.

²⁵ 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.

²⁶ Cooper C, Selwood A, Livingston G. The prevalence of elder abuse and neglect: a systematic review. *Age & Aging*, 2008;37:151-160.

(I) Seniors in long term care facilities who are abused, neglected, or financially exploited (estimate)

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,²⁷ and other self-report surveys have documented even higher rates.²⁷ 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.²⁷ Absent any gold standard method, we settled on an admittedly subjective estimate of 5-10% of senior residents of long term care facilities.

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 facilities²⁸ and made two assumptions: (1) 87.7% of such beds are occupied at some point each year²⁹ and 89.9% of residents are age 60 years or older.³⁰ We then multiplied our prevalence estimates by .877 x .899 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. Because Noble County has only one long term care facility, we did not provide an estimate in order to avoid singling out a particular institution.

(J) 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 summarizes this information. Yearly management summary reports³¹ provide 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 in each county. 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

Because self-neglect is not part of our conceptual definition of elder abuse and neglect, we excluded such reports in our estimates. Similarly we excluded reports for victims <60 years old. Our totals are based on extracting from each county's APS annual management summary report, the total number of reports for physical abuse, emotional abuse, sexual abuse, exploitation and "neglected by others" for victims 60+. To provide more stable estimates, the county profiles report the annual

²⁷ Pillemer K, Moore DW. Abuse of patients in nursing homes: findings from a survey of staff *Gerontologist*. 1989; 29:314A-320A.

²⁸ 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.

²⁹ Harrington C, Carrillo H, Blank B. Nursing facilities, staffing, residents, and facility deficiencies, 2003 through 2008. San Francisco, CA: Department of Social and Behavioral Sciences, University of California, San Francisco; 2009. Available: http://www.pascenter.org/documents/OSCAR_complete_2009.pdf

³⁰ Mehdizadeh S, Appelbaum R. *A review of nursing home resident characteristics in Ohio: Tracking changes from 1994-2004*. Oxford, OH: Scripps Gerontology Center, Miami University; no date. Available: <http://aging.ohio.gov/resources/publications/nhreschar04.pdf>

³¹ Ohio Department of Job and Family Services, Adult Protective Services. (2006, 2007, 2008, 2009). *Yearly Management Summary Report*. Columbus, OH: Unpublished.

average number for SFY 2006-07, 2007-08 and 2008-09.³² Because each county may record allegations differently, these data are unfit for comparing individual counties.

(K) Reports of abuse, neglect or exploitation filed 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 8,000 to 9,000 such "self-reported incidents" (SRI's). ODH reviews all SRI's and refers about 3,100 each year to the Ohio Attorney General's Medicaid Fraud Control Unit (MFCU). The data presented in the county profiles are limited to the SRI's that are referred to the MFCU. The figures come from unpublished spreadsheets covering 2006 to 2008 that MFCU staff were kind enough to share with us.³³

All SRI's referred to MFCU are reviewed, but only a small proportion result in a formal case investigation. Although a few SRI's 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. SRI's referred to MFCU do not include instances involving other patients or family members as perpetrators. Rather, these SRI's 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 SRI's for 2006 through 2008. Nonetheless, some counties had too few cases over three years (<20) to calculate a reliable rate. We suppressed rates for these counties, listed below in Table K1.

To calculate a rate, we divided the number of reports (i.e., SRI's) by the number of resident beds.²⁹ 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 relatively similar manner across Ohio, they can be useful for making some limited 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 62 counties with sufficient 2006-2008 data (i.e., excluding those in Table K1). These groups are listed above in Table 1 (p. 7).

³² SFY=State Fiscal Year, which runs July 1 to June 30.

³³ Thanks to Christy Haenszel, Medicaid Fraud Control Unit, Ohio Attorney General's Office. Also, Chris Compson, Dustin Ellinger, Carla Lind, Jodi Govern and Bill Robbins (all of the Ohio Department of Health) provided valuable assistance understanding the data.

Table K1. Counties with < 20 reported incidents of abuse, neglect or exploitation that occurred in long term care facilities and were referred to the Ohio Medicaid Fraud Control Unit, 2006-08.

<u>County</u>	<u># of referrals, 2006-08</u>	<u>County</u>	<u># of referrals, 2006-08</u>
Adams	12	Mercer	13
Athens	17	Monroe	5
Carroll	3	Morgan	8
Champaign	18	Noble	1
Coshocton	18	Paulding	5
Hardin	8	Perry	16
Henry	10	Pike	6
Hocking	2	Preble	8
Holmes	17	Union	7
Huron	16	Van Wert	17
Knox	17	Vinton	17
Logan	4	Williams	10
Madison	17	Wyandot	4

(L) Teenage females who smoke cigarettes (estimate)

We developed this estimate by interpolating prevalence rates from the *2007 Ohio Youth Risk Behavior Survey (YRBS)*. 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.³⁴ The 99-item, multiple-choice YRBS was administered to 2,527 students in 101 Ohio public and private high schools during spring 2007.³⁵ With a school response rate of 75 percent and a student response rate of 81 percent, the survey produced results that are representative of all Ohio high school students. 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.

Our estimate of current frequent 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.

Because grade level does not correspond to age, we used the following procedure to construct an estimate for 15-19 year old females: we took the mean prevalence rate for 10th-12th grade females and then added an additional year of 12th grade females to approximate 19 year olds. Specifically, the 2007 YRBS reported prevalence rates of 20.0%, 22.5% and 23.3% among females in 10th, 11th and 12th grades respectively. Thus, we estimated prevalence as $[20.0\%+22.5\%+23.3\%+23.3\%]/4$ or 22.3%. This assumes that the prevalence of cigarette use among high school seniors is similar to the rate among those who have recently graduated.

Because YRBS data are not available for individual counties in Ohio in 2007, we used this statewide rate for each county. Nonetheless, certain regions of the state may have higher or lower rates of

³⁴ Centers for Disease Control and Prevention. *Youth Risk Behavior Surveillance System: Youth Online: Comprehensive Results*. 2010; Available: <http://apps.nccd.cdc.gov/yrbss/>

³⁵ Ohio Department of Health. *2007 Ohio Youth Risk Behavior Survey*. Columbus, OH: Ohio Department of Health; 2008. Available: <http://www.odh.ohio.gov/ASSETS/94EF26C378E64AF08B64622EF22AA132/Ack-Intro.pdf>

cigarette use among females. Appalachian counties, for example, tend to have higher rates of youth smoking than do other areas of the country.³⁶ 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.

(M) Teenage females experiencing dating violence (estimate)

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 2007 Youth Risk Behavior Survey (YRBS).³⁵ The national YRBS uses similar methods as local and state YRBS surveys, although the sampling procedure differs. The YRBS is conducted by the Centers for Disease Control and Prevention (CDC) every two years, and is a well-regarded measure of the prevalence of different adolescent risk behaviors. In 2007, 14,103 9th-12th graders in 157 schools completed the survey. With a school response rate of 81% and a student response rate of 84%, the survey produced results that are representative of all 9th-12th grade students in the United States.³⁷ Nationwide, 10.1% of female 12th grade students answered "yes" to the question: "During the past 12 months, did your boyfriend or girlfriend ever hit, slap or physically hurt you on purpose?"

We used the national estimate because Ohio data on dating violence with confidence intervals were unavailable by grade and gender.³⁸ 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.³⁹

Because YRBS estimates are for 9th through 12th graders, we needed to adjust them to be consistent with our age group of 15-19 year old females. We took the mean of the estimates for 10th, 11th, and 12th grades and added an additional year of the 12th grade estimate to account for 19 year olds who had left high school. Specifically, the 2007 YRBS reported prevalence rates of 8.8%, 10.2% and 10.1% among females in 10th, 11th and 12th grades respectively. Thus, we estimated prevalence as $[8.8\%+10.2\%+10.1\%+10.1\%]/4$ or 9.8%. This assumes that the prevalence of dating violence among high school seniors is similar to the rate among those who have recently graduated.

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 recanted or described as non-violent in in-depth follow up interviews.⁴⁰ On the other hand, the YRBS measure excludes any uncompleted physical violence (e.g., threats) emotional abuse or sexual violence; all

³⁶ 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>

³⁷ Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance — United States, 2007. Surveillance Summaries, **June 6, 2008**. MMWR 2008;57(SS-4). Available: <http://www.cdc.gov/mmwr/PDF/ss/ss5704.pdf>

³⁸ 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).

³⁹ Ohio Department of Health. *Ohio Youth Risk Behavior Survey, 2007, Injury*. Columbus, OH: Author; 2008. Available: <http://www.odh.ohio.gov/ASSETS/CFF5C1975E334EE7B277CC17D8BE55F8/Injury-Men%20Health.pdf>

⁴⁰ 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.

important components of conceptual definitions of teen dating violence. For example, 10.9% of female 12th grade students reported that they had been forced to have sexual intercourse when they did not want to.³⁵ As a result, our estimate may undercount girls who experience these 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%.⁴¹ 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.⁴² 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.⁴³ 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 prevalence of teen 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.⁴⁴ Similarly, our own review of 2007 YRBS data from 40 US states and territories found few differences in past-year prevalence.³⁵ Across locations, rates for 9th through 12th graders ranged from 15.7% (Georgia) to 7.2% (Iowa), but overlapping confidence intervals (see above, p. 8) suggested no significant differences across most locations.

(N) Pregnancies among female teenagers

Mean number of pregnancies among females 15-19 years old per year, 2006, 2007 and 2008.⁴⁵ This figure includes live births, induced abortions and estimated fetal losses.

⁴¹ 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

⁴² 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.

⁴³ Finkelhor D, Ormrod R, Turner H, Hamby SL. The victimization of children and youth: A comprehensive, national survey. *Child Maltreat* 2005; 10; 5-25.

⁴⁴ 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.

⁴⁵ Ohio Department of Health, *Estimated teenage pregnancies and rates per 1,000 females, by county and year and age group, Ohio*. Unpublished. Thanks to John Paulson, Bureau of Public Health Informatics, Ohio Department of Health, for providing the data.

(O) Teenage girls/Adult women/Seniors injured in motor vehicle crashes

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 2007 and 2008 based on unpublished data provided by the Ohio Department of Public Safety.⁴⁶ 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.

(P) Mothers not receiving prenatal care during their first trimester.

This figure represents the mean number of women per year who did not receive prenatal care during their first trimester. This includes women giving birth who either never received prenatal care or who began receiving prenatal during their second or third trimester. Data are from birth certificates from 2006 and 2007 that were analyzed and reported by the Ohio Department of Health.⁴⁷

For 23% of women who give birth, prenatal care does not appear on the birth certificate, so their status is classified as "unknown." Rather than ignore this group, we presumed that the percentage of births with known status that are past the first trimester would be similar to that in the group with unknown status. The percentage varied by county, so we used each county's percentage to estimate the proportion of mothers with "unknown" status who received prenatal care after the first trimester. For example, in Cuyahoga County in 2006, mothers of 4,240 of 13,353 live births (31.8%) received no prenatal care during their first trimester. In addition, 3,329 birth certificates had no data on prenatal care. We assumed that 31.8% of these "unknowns" also had no care during the first trimester and so estimated that an additional (3,329*31.8%=) 1,057 mothers should be added to the total. In summary, we estimated that (4,240 + 1,057=) 5,297 mothers who had live births in Cuyahoga County in 2006 had not received prenatal care. Along with our estimate of 5,383 for 2007 yields an average of 5,340 mothers per year for Cuyahoga County. If mothers with unknown prenatal care status have a different likelihood of not receiving first trimester prenatal care, our estimates could be biased.⁴⁸

(Q) New cancer cases among adult women/seniors

This number is the average annual number of primary cancers reported to the Ohio Cancer Incidence Surveillance System (OCISS) during 2003, 2004 and 2005 (the most recent years for which data are publicly available). 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. The listed Ohio county is the patient's residence at the time of diagnosis. Ohio residents diagnosed or treated for cancer in the states of Indiana, Michigan, Pennsylvania, West Virginia, Kentucky and Florida are also reported to OCISS through

⁴⁶ We acknowledge the support of Jon Heil and Dave Baker of the Ohio State Highway Patrol, Office of Strategic Services for their assistance providing and helping us interpret the data.

⁴⁷ Ohio Department of Health. Information Warehouse. *Ohio Live Births: Trimester of Entry into Prenatal Care*. Available: <http://dwhouse.odh.ohio.gov/datawarehousev2.htm>

⁴⁸ It is unlikely there is any such bias; most of the unknown prenatal status is due to "last menses date" being blank or labeled "uncertain." (Personal communication to Kenneth Steinman by John Paulson, Bureau of Health Surveillance, Ohio Department of Health, March 17, 2010.)

reciprocal agreements with these states. Using the OCISS website, we tallied separate estimates for women⁴⁹ and seniors.⁵⁰

(R) Seniors injured from falls (estimate)

Our estimates are from the Behavior Risk Factor Surveillance System (BRFSS), an annual survey of over 350,000 Americans that provides critical data on the prevalence and trend of various health behaviors and outcomes. Analysis of BRFSS data from 2006, found that 14.3% of Ohio residents 65+ years old reporting having fallen at least once during the past 3 months.⁵¹ Moreover, of the seniors who had fallen, 31.6% had at least one fall that resulted in an injury that caused the respondent "...to limit your regular activities for at least a day or to go see a doctor." Taken together, we estimate that (14.3%*31.6%=) 4.52% of Ohio seniors are injured in falls each year (95% confidence interval, 3.15% - 6.16%). With little evidence of geographic variation in falls among the elderly,⁵² we feel it is appropriate apply national figures to Ohio and its constituent counties.

In using this estimate, we make several assumptions. First, we assume that the rate of fall injuries is similar among 60-64 year olds as it is among older respondents (no data were provided for 60-64 year olds). Because the likelihood of falling increases with age,⁵² the risk for 60-64 year olds is likely lower. As such, our figure may overestimate the true number of fall injuries. Another assumption is that the likelihood of falling during the past 3 months is equivalent to the likelihood of falling during the past 12 months. This is clearly untrue, and may result in our underestimating the true number of falls. Finally, seniors who are frail, isolated, cognitively impaired or without telephone service are less likely to be included in BRFSS estimates. To the extent that such individuals are more likely to be injured in a fall, we may underestimate the true number of fall injuries.

To be thorough, we compared the above estimates to those from a completely different source. The National Electronic Injury Surveillance System (NEISS)⁵² uses hospital data to record the prevalence of different kinds of injuries. We looked at nonfatal injuries among 60+ years old that are due to falls that are seen in a hospital emergency department (ED). These counts do not include injuries where (1) the principal diagnosis was unknown or was an illness, pain only, or psychological harm (such as anxiety or depression) only; (2) an injury-related diagnosis was not specified; (3) the patient died on arrival at the ED or during treatment in the ED.⁵³

⁴⁹ Ohio Department of Health. *Staged Cancer Data Report*. [Selected Report Criteria: Year: 2003, 2004, 2005 County: All Counties Gender: Females Age Groups: All Age Groups Stage: All Stages Cancer Types: All Cancer Types], Columbus, OH: Author; 2008. Available: <http://publicapps.odh.ohio.gov/pwh/PWHMain.aspx?q=120809090214>

⁵⁰ Ohio Department of Health. *Staged Cancer Data Report*. [Selected Report Criteria: Year: 2003, 2004, 2005 County: All Counties Gender: All Genders Age Groups: 65-74, 75-84, 85+ Stage: All Stages Cancer Types: All Cancer Types], Columbus, OH: Author; 2008. Available: <http://publicapps.odh.ohio.gov/pwh/PWHMain.aspx?q=120809090214>

⁵¹ Stevens JA, Mack KA, Paulozzi LJ, Ballesteros MF. Self-Reported Falls and Fall-Related Injuries Among Persons Aged ≥ 65 Years --- United States, 2006. *MMWR*, 2008;57(09);225-229.

⁵² Centers for Disease Control and Prevention. *Non-fatal injury reports: Data from 2001 and later*. Web-based Injury Statistics Query and Reporting System (WISQARS); 2009. Available: <http://webappa.cdc.gov/sasweb/ncipc/nfirates2001.html>

⁵³ We determined that including fatal injuries from falls would add little to our estimates. In 2006, for every fatal fall injury among seniors, NEISS estimated about 121 nonfatal fall injuries in this age group. See: Centers for Disease Control and Prevention. *Fatal injury reports: Data from 1999 and later*. Web-based Injury Statistics Query and Reporting System (WISQARS); 2009. Available: http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html

Using NEISS data for the years 2006 through 2008, we estimated that each year, 4.34% (95% confidence interval, 3.64% - 5.05%) of adults over age 60 years had a non-fatal injury attributable to a fall. Given the similarity of this estimate to our initial estimate, we feel our figure is a reasonable approximation.

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