Crime

Overview

A desired outcome common to many charitable programs is the overall reduction of crime in society, either by preventing young people from becoming involved with crime in the first place, or by motivating those already with history with the criminal justice system to stop criminal offending. Crime presents a heavy economic and social burden to Canadian society. In 2008, the total social and economic costs of Criminal Code offences in Canada were about $31.4 billion[1]; with inflation and population growth, this would be over $40 billion in 2022. Yet, this figure represents only tangible costs – criminal justice system costs, health care and productivity costs to victims, etc. It does not include intangible costs such as the value of lost life due to homicide or pain and suffering caused to victims of other, principally violent, crimes. These latter are real costs, and would balloon the figure based on tangible costs alone. To prevent someone from committing crime, even to some modest extent, has the potential to save society and crime victims from considerable tangible and intangible costs.

A sizeable research literature has grown up around the subject of the costs of crime, and cost data are available now on a per-crime basis for a wide variety of specific crime types. Simultaneously, longitudinal studies spanning decades have tracked the offending patterns of cohorts of individuals as they have moved from childhood to adolescence to adulthood. It is now possible to observe, in various contexts, how criminal offending changes based on factors such as age, sex, and type of offender. Together with the data on the costs of specific crimes, data on criminal trajectories allow us to estimate what the cost of crime is at different stages in life, for males and females, for more or less serious offenders. We consider the first of these data – the costs of specific crimes – in the section that follows.

Costs of Specific Crimes

We estimate the costs-per-crime of twenty-nine specific types of crime; the full list of crimes is available in Appendix I, along with from which source(s) raw data were collected. In calculating the costs of crime, researchers adopt alternatively a "bottom up" or "top down" approach. Generally speaking, the bottom up approach recognizes costs generated as a consequence of crime (i.e., to victims) or as a response to crime (i.e., those connected with the criminal justice system)[2]. Comparatively, the top down approach recognizes these costs plus costs associated with the anticipation of crime, including the fear of crime, actions taken or expenditures made by the public to avoid crime, as well as the loss to communities of social cohesion[3]. In the present analysis, we focus only on costs as consequences or in response to crime, in line with a bottom up approach.

The overall cost of any one crime is usually a combination of multiple types of costs. Some researchers focus on few or one type(s) of cost (e.g., the costs to victims), while others attempt to canvas all costs across all domains. In the second case, costs seem to group into five distinct categories of costs: tangible costs to victims, intangible costs to victims, criminal justice system costs, offender productivity costs, and the costs of unreported offending. Tangible costs to victims are directly observable costs related to things like

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[1] Zhang, T. (2008). *Costs of crime in Canada, 2008*. Department of Justice Canada.

[2] Dubourg, R., Hamed, J., & Thorns, J. (2005). *The economic and social costs of crime against individuals and households 2003/04*. Home Office, Research, Development and Statistics Directorate.

[3] Cohen, M. A., & Piquero, A. R. (2009). New evidence on the monetary value of saving a high risk youth. *Journal of Quantitative Criminology*, *25*, 25-49.

stolen or damaged property, hospitalization, and lost work time due to injury or trauma. Intangible costs to victims include lost life due to homicide and pain and suffering caused by, principally violent, crime. Criminal justice system costs include the costs of the police, the courts, and corrections. Offender productivity costs refer to the opportunity cost of criminal behaviour, in the sense that while the person was engaged in crime or incapacitated by the corrections system, they could have, alternatively, been earning a legitimate income. Unreported offending, finally, refers to all of the crime that is committed that is never discovered by the authorities (the "dark figure" of crime); these are criminal events that, though they are not picked up by the justice system (and therefore do not incur costs in that domain) still involve costs to the victims who suffer by them.

In the present analysis, we estimate per-crime costs in each of the aforementioned domains. In order to do so, we rely principally on five studies. It is not possible for us to simply collect the raw data from these studies and input them into our model. In calculating their costs, the authors make assumptions that are inconsistent with some of our most principal standards that we apply across programs. The area in which this most applies is intangible costs to victims, which of necessity are based on decisions about the value of statistical life, the authors' implicit or explicit choice of which deviates from our own. Usually the value of statistical life used in these studies exceeds our own by a considerable degree, such that violent crimes especially will appear more costly than otherwise they would if the authors had elected to use our, somewhat more modest, value on this criterion. For all categories of costs, base currencies are adjusted for exchange rate where applicable and inflated to 2022 CAD. We introduce briefly our cited studies and describe notable transformations of their raw data.

Selected Studies on the Costs of Specific Crimes

Dubourg, Hamed, and Thorns (2009) estimate the costs of crime in England and Wales in 2003/04[4]. Costs are provided for the aggregate categories of victim and criminal justice system costs, but within these also for specific subcategories of costs. Thus, victim costs include physical/emotional costs, stolen property, damaged property, victim services, lost productivity, and health services. Of these we understand physical/emotional costs as the intangible costs to victims, while the rest are tangible costs. The authors use disability weights for the seriousness of physical and/or emotional trauma caused, on average, by different types of crime. The value the authors used for one year of statistical life was £80,620, based on 1997 currency. Adjusted for exchange rate and inflation, this equals $260,487 in 2022 CAD, or about 2.6 times the value of one year of statistical life ($100,000) that currently we apply across our model. We therefore adjust down all intangible victim cost items by 2.6 times, to render these consistent with the prevailing assumptions of our model. Uniquely, for the intangible victim cost related to homicide, we do not work from the authors' raw data but instead calculate this for ourselves[5]. Finally, to facilitate comparability with crime cost estimates from other (predominantly American) studies, we rebrand the authors' 'serious wounding' and 'other wounding' crime categories as aggravated assault and common assault, and collapse into the single categories of (minor) theft and motor vehicle theft respectively the authors' categories of 'theft - not vehicle' and 'theft from vehicle', on the one hand, and 'theft of vehicle' and 'attempted vehicle theft', on the other hand.

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[4] Dubourg, R., Hamed, J., & Thorns, J. (2005). *The economic and social costs of crime against individuals and households 2003/04*. Home Office, Research, Development and Statistics Directorate.

[5] Since the intangible cost in this case is simply the value of the number of years of life lost due to being killed, we need nothing else but our own, discounted value of a statistical life. If the median person in Canada is aged 42.2 and life expectancy is 82.8, then the number of years of life remaining to a Canadian in general is 40.6. If we take our value for one year of statistical life ($100,000) and multiply it by 40.6, we get an undiscounted lifetime value of statistical life of $4,061,000. This is what we estimate is the value of statistical life otherwise remaining to someone had they not been killed. We then discount this value by 3 percent per annum for 40.6 years to harmonize them with our model. In the event, this comes out to a discounted lifetime value of statistical life of $1,222,681. This is our chosen method for estimating the intangible victim cost of homicide; we do not use the raw data provided by this or any subsequently referenced study for this crime cost component.

McCollister, French, & Fang (2010) report tangible and intangible victim, criminal justice system, and offender productivity costs for several types of crime in the United States[6]. Intangible costs to victims are based on jury awards (damages) to victims of (usually violent) crime, for physical and emotional pain and suffering. Juries don't explicitly state a value of statistical life used for determining awards, but based on the average sizes of awards for different types of crime juries' implicit assumptions about this value can be estimated. Smith (2000) examines jury verdicts to develop a range of estimates for the value of statistical life implied by juries' decisions – $2,300,000 to $4,900,000 in 2000 USD, with an average of $3,600,000; or about $8,308,803 in 2022 CAD[7]. If the median person in the United States is aged 38.1 and life expectancy is 79.1, then the number of years of life remaining to an average American is 41.0. If we divide $8,308,803 by 41.0, we get an estimate of the jury-implied value of one year of statistical life – $202,901. Dividing our own value value for one year of statistical life by $202,901, we get 0.49 for the ratio of our-versus-jury-implied single-year statistical life values. We can then estimate intangible victim costs by applying this ratio to the authors' cost figures.

Miller, Cohen, & Wiersema (1996) report tangible and intangible victim costs of several types of crime in the United States, with tangible costs disaggregated into subcategories[8]. Intangible costs to victims are again based on jury awards data, and we handle these the same way as described earlier. The authors provide tangible victim cost estimates that are unique to different causes of homicide (arson deaths, impaired driving deaths, "other" – rape-murder, robbery, child abuse/neglect – deaths) and we have collapsed these into an overarching homicide category based on the prevalence of each type of homicide.

Cohen & Piquero (2009) report overall victim, criminal justice system, and offender productivity costs of several types of crimes in the United States[9]. Costs to victims are not separated into tangible and intangible costs. Based on the ratio of tangible to intangible costs to victims reported for several crime types by Miller, Cohen, & Wiersema (1996), we estimate how much of the total victim costs reported by Cohen & Piquero were tangible versus intangible. This is a necessary step because, again, intangible costs to victims are based on jury awards data, and we have to do our best to maintain consistent values for the annual value of statistical life. Once victim costs are apportioned between tangible and intangible costs, we adjust the newly estimated intangible costs according to our now familiar process for transforming jury awards data to honor our value of one year of statistical life.

Day, Koegl, Rossman, & Oziel (2015) report overall victim costs of twenty-nine types of crime in Canada, based primarily on a synthesis of the findings by the above-cited authors, in addition to which they add a few other types of crime[10]. Because most of the authors' cost estimates came directly from studies whose raw data we collected at the source, we did not count again those estimates but focused instead exclusively on the crime types that were uniquely introduced by Day, Koegl, Rossman & Oziel. These were serious assault, weapons use, serious theft, serious mischief, weapons possession, drug dealing, prostitution/morals, and administration of justice offences.

Synthesizing Crime Costs

[6] McCollister, K. E., French, M. T., & Fang, H. (2010). The cost of crime to society: New crime-specific estimates for policy and program evaluation. *Drug and Alcohol Dependence*, *108*, 98-109.

[7] Smith, S. V. (2000). Jury verdicts and the dollar value of human life. *Journal of Forensic Economics*, *13*(2), 169-188.

[8] Miller, T. R., Cohen, M. A., & Wiersema, B. (1996). *Victim costs and consequences: A new look*. National Institute of Justice.

[9] Cohen, M. A., & Piquero, A. R. (2009). New evidence on the monetary value of saving a high risk youth. *Journal of Quantitative Criminology*, *25*, 25-49.

[10] Day, D. M., Koegl, C. J., Rossman, L., & Oziel, S. (2015). *The monetary cost of criminal trajectories for an Ontario sample of offenders*. Public Safety Canada.

Crime

From our five cited studies a list of twenty-nine discrete types of crime was generated, there being for each crime type some combination of data on tangible and intangible victim, criminal justice system, and offender productivity costs. The ideal case was full cost data including both tangible and intangible victim costs; a cost related to the criminal justice system; and an offender productivity cost. Most studies did not provide all of that information, and we filled in our crime-specific cost values by drawing on all of the studies taken together.

When one or more data points were available for a given type of cost for a given crime, we averaged the data. Otherwise, we filled in holes in the data by reference to other, similar, types of crime. Following the convention in Day, Koegl, Rossman, & Oziel (2015), costs of serious assault are the average of those of aggravated and common assault; costs of serious theft are the average of those of minor theft and motor vehicle theft; costs of serious mischief are the average of those of serious theft and vandalism/mischief; costs of weapons use are equal to those of common assault; tangible and intangible victims costs of weapons possession and drug dealing are $1,000 and $0; and tangible and intangible victims costs of prostitution/morals and administration of justice offences are both $0. Additionally, we assume costs of abduction/kidnapping are equal to costs of serious assault; that costs of intimidation are equal to those of common assault; and that costs of extortion are equal to those of serious theft. We assume that tangible and intangible victims costs of counterfeiting/forgery are equal to those of serious theft, and that tangible and intangible victims costs of embezzlement are equal to those of fraud. Finally, we assume that criminal justice system and offender productivity costs of weapons possession, drug dealing, drug possession, prostitution/morals, and administration of justice offences are equal to those of the category 'other crimes'.

Unreported Offending, Offence Multiples

Our analysis of the costs of crime is not complete without including the costs of crimes that are not officially processed. For every crime that comes to the attention of the police (whose perpetrator is found out and processed by the criminal justice system) there are several – sometimes scores – of crimes that go undetected by the authorities. Such crimes do not incur costs to the criminal justice system, but the costs to victims are still very real.

In order to understand the cost of unreported offending, we need to know, for each type of crime, how many crimes are actually committed for every crime that leads ultimately to police intervention or arrest[11]. We estimate 'offence multiples' for several types of crime based on data reported by Cohen & Piquero (2009) and Day, Koegl, Rossman, & Oziel (2015); in either case, estimates of offence multiples come from studies that compare official police records of convicted offenders to their self-reported offending behaviour[12]. Cohen & Piquero report offence multiples for juvenile offenders as well as adults, for several types of crime[13]. Day, Koegl, Rossman, & Oziel report offence multiples for many more types of crime, which are not, however, disaggregated by age group[14]. In most cases, we calculate offence multiples for youth-committed crimes by taking the average of the youth offence multiple from Cohen & Piquero (when

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[11] Cohen, M. A., & Piquero, A. R. (2009). New evidence on the monetary value of saving a high risk youth. *Journal of Quantitative Criminology, 25*, 25-49.

[12] Ibid.

[13] Juvenile estimates come originally from Farrington, D. (2003). Developmental and life-course criminology: Key theoretical and empirical issues – The 2002 Sutherland Award address. *Criminology*, 41(2), 221-256. Adult estimates (two different sets of them) come originally from Blumstein, A., & Cohen, J. (1979). Estimation of individual crime rates from arrest records. *The Journal of Criminal Law and Criminology*, 70(4), 561-585; and Chaiken, J., & Chaiken, M. (1982). *Varieties of criminal behavior*. Rand Corporation.

[14] Most offence multiple estimates come from a combination of Cohen & Piquero (2009), Farrington (2003), as well as from Farrington, D. P., Auty, K. M., Coid, J. W., & Turner, R. E. (2013). Self-reported and official offending from age 10 to age 56. *European Journal of Crime Policy Research*, *19*, 135-151. Other offence multiples are estimated by the authors themselves.

this is available) and the corresponding multiple reported by Day, Koegl, Rossman, & Oziel. For adults, we calculate offence multiples by taking the average of the adult multiples reported by Cohen & Piquero and the corresponding multiple from Day, Koegl, Rossman, & Oziel. We calculate the youth and adult multiples for serious assault by averaging, respectively, the youth and adult multiples for aggravated and common assault. The youth multiple for serious theft is the multiple reported by Day, Koegl, Rossman, & Oziel multiplied by the youth-to-adult ratio of multiples for minor theft. Similarly, we calculate youth multiples each for intimidation, weapons use, and weapons possessions by multiplying the values reported by Day, Koegl, Rossman & Oziel by the average youth-to-adult ratio of multiples for other violent crimes. Finally, we assume a multiple of one for both youth and adult administration of justice offences. We present our estimates of crime-specific youth and adult offence multiples in Table I.

Table I – Offence Multiples

	youth	adults
homicide	1.0	1.0
armed robbery	7.2	11.6
robbery	7.5	11.8
rape/sexual assault	6.8	7.9
abduction/kidnapping	1.0	1.0
initimidation	10.4	12.2
aggravated assault	6.8	7.9
serious assault	10.6	10.4
common assault	14.3	12.9
weapons (use)	6.7	7.9
burglary/break and enter	5.6	16.4
motor vehicle theft	3.8	15.3
serious theft	2.3	15.0
minor theft (incl. stolen property)	5.8	38.4
vandalism/mischief	14.4	13.5
serious mischief	8.4	7.9
arson	6.8	7.9
extortion	4.6	12.2
counterfeiting/forgery	5.7	15.0
fraud (incl. embezzlement)	10.4	33.6
drugs (dealing & possession)	53.0	60.1
weapons (possession)	6.7	7.9
impaired driving	1.0	1.0
administration of justice	1.0	1.0
other	5.2	28.2

Based on our estimates of youth and adult offence multiples, we calculate crime-specific costs of unreported offending. We calculate these uniquely for youth versus adult offenders by multiplying our estimates of victim (tangible plus intangible) costs per crime type by, respectively, our estimated youth versus adult offence multiples[15]. In view of our newly constructed costs of unreported offending, we estimate total victim costs (including tangible and intangible victim costs, plus costs of unreported offending), criminal justice system costs, and offender productivity (income) costs per type of crime for youth versus adults;

[15] Whenever we multiply a victim cost by an offence multiple, we subtract 1 from the multiple in order to not double count the victim cost of the reported crime that already has been accounted for. Thus, for example, homicide, which has a multiple of one, would have no unreported offending cost.

offender income costs apply only to adult offenders. We record costs-per-crime estimates in Table II. Discrete crime costs are aggregated into broader categories such as all crime, violent crime, property crime, drugs, other crime, felony (serious), and misdemeanor (less serious), based on the relative frequency of each type of crime committed by members of the samples on which Cohen & Piquerro (2009) and Day, Koegl, Rossman, & Oziel (2015) based their research[16].

Table II – Costs by Type of Crime ($)

	victim costs		unreported offending		victim costs, total		criminal justice system costs		offender productivity	
	tangible	intangible	youth	adults	youth	adults	youth	adults	youth	adults
homicide	1,781,213	1,222,681	0	0	3,003,894	3,003,894	480,066	480,066	0	202,831
armed robbery	11,381	14,795	162,286	277,457	188,461	303,632	20,985	20,985	0	11,420
robbery	4,826	4,887	63,136	104,904	72,850	114,617	12,720	12,720	0	5,814
rape/sexual assault	11,879	85,527	564,953	672,100	662,359	769,505	19,747	19,747	0	9,593
abduction/kidnapping	9,575	12,233	126,489	150,478	148,297	172,286	12,335	12,335	0	6,041
initimidation	5,369	7,027	118,375	116,515	130,770	128,911	8,160	8,160	0	3,948
aggravated assault	1,162	1,820	39,662	35,487	42,644	38,469	3,985	3,985	0	1,856
serious assault	2,451	487	13,367	45,243	16,305	48,181	4,231	4,231	0	1,185
common assault	681	68	3,591	28,007	4,339	28,755	2,382	2,382	0	613
weapons (use)	6,855	438	20,239	104,295	27,532	111,588	3,317	3,317	0	1,097
burglary/break and enter	3,768	253	5,081	56,291	9,102	60,311	2,849	2,849	0	855
motor vehide theft	4,245	0	20,377	158,913	24,622	163,158	9,479	9,479	0	1,568
serious theft	621	294	12,222	11,413	13,137	12,329	2,356	2,356	0	486
stolen property	2,195	274	18,309	17,030	20,777	19,498	2,603	2,603	0	670
minor theft	5,369	7,027	0	0	12,395	12,395	8,160	8,160	0	3,948
vandalism/mischief	1,162	1,820	28,043	33,400	31,025	36,382	3,985	3,985	0	1,856
serious mischief	1,162	1,820	17,108	20,577	20,090	23,559	3,985	3,985	0	1,856
arson	1,000	0	5,737	6,900	6,737	7,900	714	714	0	0
extortion	32,562	19,759	303,464	361,017	355,785	413,338	4,256	4,256	0	904
counterfeiting/forgery	3,768	253	14,475	45,032	18,496	49,053	2,849	2,849	0	855
embezzlement	3,768	253	18,720	56,291	22,741	60,311	6,380	6,380	0	914
fraud	1,570	0	14,761	51,140	16,331	52,710	6,678	6,678	0	914
drug dealing	1,570	0	14,761	51,140	16,331	52,710	4,242	4,242	0	957
drug possession	1,000	0	52,000	59,067	53,000	60,067	714	714	0	0
weapons (possession)	0	0	0	0	0	0	714	714	0	0
impaired driving	13,132	13,094	0	0	26,225	26,225	2,427	2,427	0	999
prostitution/morals	0	0	0	0	0	0	714	714	0	0
administration of justice	0	0	0	0	0	0	714	714	0	0
other	0	0	0	0	0	0	714	714	0	0
all crime					46,975	86,980	5,878	7,499	0	3,004
violent crime					158,892	209,435	14,318	18,185	0	8,322
nonviolent crime					12,386	31,251	2,853	2,437	0	521
property crime					15,518	50,421	3,697	3,780	0	905
drugs					18,219	22,711	714	714	0	0
other crime					1,286	1,690	715	740	0	15
felony					79,616	151,633	9,250	12,462	0	5,173
misdemeanor					8,503	14,700	1,883	1,713	0	439

Notes

violent crime includes homicide, armed robbery, robbery, rape/sexual assault, abduction/kidnapping, intimidation, aggravated assault, serious assault, common assault, and weapons use

nonviolent crime includes arson, motor vehide theft, counterfeiting/forgery, burglary/break and enter, serious theft, serious mischief, extortion, fraud, stolen property, minor theft, vandalism/mischief, weapons possession, drug dealing, impaired driving, prostitution/morals, drug possession, administration of justice, and other

property crime includes burglary/break and enter, motor vehide theft, serious theft, stolen property, minor theft, vandalism/mischief, serious mischief, arson, extortion, counterfeiting/forgery, embezzlement, and fraud

drugs includes drug dealing and drug possession

other crime includes weapons possession, impaired driving, prostitution/morals, administration of justice, and other

felony includes homicide, armed robbery, robbery, rape/sexual assault, abduction/kidnapping, intimiation, aggravated assault, serious assault, weapons use, burglary/break and enter, motor vehide theft, serious theft, stolen property, serious mischief, arson, extortion, counterfeiting/forgery, embezzlement, fraud, weapons possession, and drug dealing

misdemeanor includes common assault, minor theft, vandalism/mischief, drug possession, impaired driving, prostitution/morals, administration of justice, and other

Costs of Offenders

We estimate the annual costs to victims, society, and to offenders themselves associated with different categories of offenders and their offence trajectories. Our estimates are based on samples of offenders in Day, Koegl, Rossman, & Oziel (2015), Cohen & Piquero (2009), and Cohen, Piquero, &

[16] For example, offenders in Day, Koegl, Rossman, & Oziel (2015) incurred, on average, 0.22 violent crime charges per year from age 18 to 26, of which 0.8% were for homicide, 1.7% were for armed robbery, 17.1% were for robbery, 8.2% were for rape/sexual assault, 1.7% were for abduction/kidnapping, 15.1% were for intimidation, 7.5% were for aggravated assault, 18.6% were for serious assault, 28.0% were for common assault, and 1.4% were for weapons use. Multiplying each of these by per-crime cost estimates for adults produces an estimate for the cost per violent crime committed by adults. The same approach is used for youth offenders and for other broad categories of crime. The offender sample in Cohen & Piquero (2009) provides another source of raw data on which to perform these analyses. The costs generated based on both sets of raw data are then averaged.

Jennings (2010)[17]. A well established finding in the criminological literature is that it is often a small percentage of offenders (around five to fifteen percent) who are responsible for a disproportionate share (around half – fifty percent) of all offences committed[18]. This also implies that a disproportionately small share of total crime is committed by the largest proportion of all offenders. In determining our estimates of the costs of criminal offending, we therefore consider offenders separately not only on the bases of age and sex, but also on their rate of offending.

Selected Studies on Offender Trajectories

Day, Koegl, Rossman, & Oziel (2015) report the total numbers of specific types of crime for which 386 "high-risk"[19] offenders were charged in the periods of adolescence (ages 12 to 17) and adulthood (ages 18 to 26). The annual number of offences, per person, for each type of crime during adolescence are calculated by dividing the total number of youth offences by 386 and then dividing the quotient by 6 (based on the six year period from ages 12 to and including 17). Similarly, the annual number of offences per person committed during adulthood are calculated by dividing the total number of adult offences by 386 and dividing the quotient by 9. The average annual number of specific types of crimes committed by each person during adolescence, and then during adulthood, are multiplied by our crime-specific costs, such to give us, for youth versus adult offenders, estimates of the total annual costs incurred by the average offender in the sample.

The authors organize their sample of offenders by seven categories of offending trajectory: low desister, low persister, moderate adolescence peaked, moderate late persister, moderate early persister, high early, high late. The authors suggest that low desisters and low persisters, together comprising 62 percent of the sample, could be grouped together as low-rate offenders. Similarly, offenders classified as moderate adolescence peaked, moderate late persister, or moderate early persister, together comprising 30 percent of the sample, could be grouped together as medium-rate offenders. Finally, offenders of the last two classifications – high early and high late, together comprising 8 percent of the sample – could be grouped together as high-rate offenders. The authors report the total, per person cost (calculated using their own methodology) incurred by members in each of the seven subgroups, from which weighted costs unique to the broader low-rate, medium-rate, and high-rate offender groups can be calculated. The average costs per offender in the low-, medium-, and high-rate groups are then compared to the per-offender cost in the sample as a whole, and ratios are generated comparing the costs of each subgroup to that of the overall sample. These ratios are then used to adjust upward or downward the number of offences we expect offenders in each subgroup (low-, medium-, high-rate) committed relative to the average offender in the sample as a whole[20]. Offence counts for each subgroup of offenders are multiplied by our costs of specific crimes to generate estimates of the costs incurred by different categories of youth and adult offenders.

Cohen & Piquero (2009) report the total numbers of specific types of crime for which offenders in their sample – who unlike those in Day, Koegl, Rossman, & Oziel were not predominantly high-risk – were charged in the periods of childhood/adolescence (ages 8 to 17) and adulthood (ages 18 to 26). The annual

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[17] Cohen, M, A., Piquero, A. R., & Jennings, W. G. (2010). Monetary costs of gender and ethnicity disaggregated group-based. *American Journal of Criminal Justice*, *35*, 159-172.

[18] Day, D. M., Koegl, C. J., Rossman, L., & Oziel, S. (2015). *The monetary cost of criminal trajectories for an Ontario sample of offenders*. Public Safety Canada.

[19] This sample was then already skewed toward a higher-rate offender than is typical of the offending population as a whole (a large proportion of which offends at a comparatively low volume). To a somewha not inconsiderable extent the costs associated with this group will show higher than those connected with a more typical offending population. However, to the extent that charities would theoretically work with individuals with higher-than-normal risk levels for offending, we do not believe our final estimates of offender costs should be seriously exaggerated.

[20] This means that all that changes between our categories of low-, medium-, and high- rate offenders is the relative volume, not severity, of crime that is committed – the same "catalogue" of offences and their relatives proportions are maintained, it is only a matter of whether there are more or fewer of each type of crime.

number of offences, per person, for each type of crime committed during childhood/adolescence, as well as during adulthood, are given by the authors for a particular subset of offenders: those with 6 or more justice system contacts up to age 26, who in this context the authors identify as the prototypical 'career criminals' whose share of all crime is disproportionately large. The average annual number of specific types of crimes committed by each person during adolescence, and then during adulthood, are multiplied by our crime-specific costs, such to give us, for youth versus adult offenders, estimates of the total annual costs incurred by this high-risk subset of the authors' sample of offenders.

The authors report the number of offenders in their sample who had, over a nineteen-year period, 1, 1 or more, 2 or more, 3 or more, 4 or more, 5 or more, 6 or more, 10 or more, and 15 or more police contacts, from which we calculate the unique number of offenders who had 1, 2, 3, 4, 5, or 6 or more contacts. We categorize offenders with one or two contacts as low-rate offenders – together these were 64 percent of all offenders in the sample. We categorize offenders with three, four, or five contacts as medium-rate offenders, and offenders with six or more contacts as high-rate offenders, these two groups respectively comprising 20 and 16 percent of all offenders in the sample. Additionally, for the original breakdown of offender groups, the authors report per-offender costs of crime (calculated using their own methodology), from which we estimate per-offender costs of crime for offenders with 1, 2, 3, 4, 5, or 6 or more contacts. We compare the costs associated with offenders with each of these number of contacts with that associated with offenders with 6 or more contacts, in order to generate ratios of the relative cost per-offender with 1 versus 6 or more contacts, 2 versus 6 or more contacts, etc. In the event these work out, respectively for 1, 2, 3, 4, or 5 contacts, to 8, 21, 34, 47, and 60 percent of the cost associated with an offender with 6 or more contacts. We then calculate weighted ratios for each of our broader subgroups (low-, medium-, and high-rate offenders) again with our high-rate (6 or more contacts) group as the comparator (because it is this group for which annual, per-offender crime-specific contact data are reported). These ratios are then used to adjust upward or downward the number of offences we expect offenders in each subgroup committed relative to an average high-rate offender[21]. Adjusted annual offence counts are multiplied by our costs of specific crimes to generate estimates of the costs incurred by different categories of youth and adult offenders.

Female Offenders

We estimate female versus male costs of offending using data from Cohen, Piquero, & Jennings (2010). The authors sort male and female members of their sample into offending trajectory groups (including no offending) and tally the number of justice system contacts made, on average, by individuals in each group through childhood/adolescence and adulthood, as well as record the total costs incurred by each group. Based on the percentage of individuals in each group, we calculate separately the average number of contacts – across the entire sample – made by male and female children/youth and adults. In the event, we estimate that the average male in the sample had a total of 3.6 contacts from ages 8 to 17 and 2.5 from ages 18 to 26. For females the findings were, respectively, 1.1 and 0.6, for female-male offending ratios in either timeframe (childhood/adolescence and adulthood) of about 0.3 to 1 – that is, female offenders committed less than a third fewer crimes than male offenders in both childhood/adolescence and adulthood.

Females, despite representing 51.6 percent of the sample, incurred only 6.7 percent of the total cost of crime committed by the sample as a whole. We calculate a ratio of the cost of female to male offending – 0.07. Notably, this is smaller than the ratio based on the number of contacts made by females and males, suggesting that a crime cost difference between the sexes is driven not only by the volume but the type (and more exactly, the severity) of offending. We apply this smaller ratio subsequently to estimate the annual cost of low-, medium-, and high-rate youth and adult female offenders.

Synthesizing Offender Costs

[21] The ratio for high-rate offender to high-rate offender is, of course, 1.

We estimate the annual victim, criminal justice system, and offender productivity (income) costs per low-, medium-, and high-rate male youth, female youth, male adult, and female adult offender. While the sample of offenders in Day, Koeegl, Rossman, and Oziel (2015) was comprised entirely of males, the sample in Cohen & Piquero (2009) – referenced also by Cohen, Piquero, & Jennings (2010) – was 51.6 percent female. Thus, while costs derived from the former are based exclusively on male offenders, costs derived from the latter are not. We therefore estimate, based on the data from Cohen, Piquero, & Jennings (described in the foregoing section on female offenders), how much larger the costs derived from Cohen & Piquero would be if based exclusively on male offenders. This has the effect, on average, of approximately doubling the costs based on the full sample.

No matter the categorization of our offender into low-, medium-, and high-rate, our male (youth and adult) estimates are always the average of the costs generated based on the data from Day, Koegl, Rossman, & Oziel (2015) and Cohen & Piquero (2009). To calculate comparable costs for female offenders, estimates of male youth and adult offender costs, for all categories of offenders, are simply multiplied by the ratio of female-to-male offending costs gleaned from Cohen, Piquero, & Jennings (2010) (i.e., 0.07). Our estimates of the annual victim, criminal justice system, and offender productivity (income) costs per low-, medium-, and high-rate male youth, female youth, male adult, and female adult offender are presented in Table III. We present these costs for a hypothetical offender who committed many types of crime, as well as for offenders who committed exclusively violent, property, drug, or other crimes. We include also estimates for offenders whose rate of offending is unknown, which we generate by weighting cost estimates by our estimates of what percentages of offenders offend at a low, medium, or high rate (discussed below).

Table III – Annual Costs by Offender Category ($)

	male youth		female youth		male adults			female adults		
	victim costs	CJS costs	victim costs	CJS costs	victim costs	CJS costs	offender income	victim costs	CJS costs	offender income
all crime										
all offenders	38,660	4,791	2,597	322	50,833	4,119	1,556	3,415	277	104
low-rate offender	20,332	2,515	1,366	169	26,061	2,070	765	1,751	139	51
medium-rate offender	50,409	6,248	3,386	420	66,533	5,408	2,048	4,469	363	138
high-rate offender	98,476	12,218	6,615	821	131,913	10,840	4,152	8,861	728	279
violent crime										
all offenders	29,382	2,323	1,974	156	34,197	2,842	1,302	2,297	191	87
low-rate offender	15,264	1,133	1,025	76	16,951	1,370	628	1,139	92	42
medium-rate offender	38,382	3,062	2,578	206	44,976	3,752	1,718	3,021	252	115
high-rate offender	75,524	6,237	5,073	419	90,842	7,688	3,519	6,102	516	236
property crime										
all offenders	8,569	2,286	576	154	14,768	1,089	248	992	73	17
low-rate offender	4,705	1,280	316	86	8,147	595	134	547	40	9
medium-rate offender	11,100	2,951	746	198	19,114	1,412	323	1,284	95	22
high-rate offender	21,113	5,542	1,418	372	36,246	2,692	621	2,435	181	42
drug crime										
all offenders	580	17	39	1	1,597	43	0	107	3	0
low-rate offender	287	9	19	1	805	22	0	54	1	0
medium-rate offender	762	23	51	2	2,096	56	0	141	4	0
high-rate offender	1,540	45	103	3	4,197	111	0	282	7	0
other crime										
all offenders	253	187	17	13	351	158	10	24	11	1
low-rate offender	122	102	8	7	189	87	5	13	6	0
medium-rate offender	334	242	22	16	456	206	14	31	14	1
high-rate offender	686	462	46	31	880	387	28	59	26	2

Other Important Data

In this final section we identify other data (or emphasize data already touched on) related to the costs of crime that are important in other applications of our model. First, we estimate, averaging the findings from Day, Koegl, Rossman, & Oziel (2015) and Cohen & Piquero (2009), that over a person's criminal career (their duration of offending) 53 percent of offenses are committed in youth, while the remaining 47 percent are committed in adulthood. Second, we identify three types of offenders based on their rate of offending, with 64, 20, and 16 percent of offenders, we have estimated, being low-, medium-, and high-rate offenders. Third, based on the samples of offenders in the studies cited throughout, we estimate that criminal offending begins at age 12 and ends (or, at least, becomes much reduced or negligible) at age 26, over which period youth offending would be considered to encompass ages 12 through 17, while adult offending would encompass

ages 18 through 26. Finally, as it relates to intangible costs to victims of specific crimes, we assume that 80 and 20 percent of intangible costs are, in the context of violent crimes, related to mental versus physical health, while in the context of non-violent crimes we choose 100 and 0 percent for these values.

Appendix I – Sources of Costs by Types of Crime

	Dubourg, Hamed, & Thorns (2005)	McCollister, French, & Fang (2010)	Miller, Cohen, & Wierseema (1996)	Cohen, & Piquero (2009)	Day, Koegl, Rossman, & Oziel (2015)
homicide	X	X	X	X	
armed robbery				X	
robbery	X	X	X	X	
rape/sexual assault	X	X	X	X	
abduction/kidnapping					
initimidation					
aggravated assault	X	X		X	
serious assault					X
common assault	X			X	
weapons (use)					X
burglary/break and enter	X	X	X	X	
motor vehicle theft	X	X	X	X	
serious theft					X
stolen property		X			
minor theft	X	X	X	X	
vandalism/mischief	X	X		X	
serious mischief					X
arson		X	X	X	
extortion					
counterfeiting/forgery		X			
embezzlement		X			
fraud		X		X	
drug dealing					X
drug possession					X
weapons (possession)					X
impaired driving			X	X	
prostitution/morals					X
administration of justice					X
other				X	X

Notes: We estimate the costs of extortion, abduction/kidnapping, and intimidation with reeference to other crime types