Solutions Paper

Violence and Crime in Latin America

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I. CHALLENGES

A. Background

The public survey that was conducted by the IDB for this project identified the problem of "crime and violence" to be one of the areas of major concern in Latin America. In particular, the following items were identified (in descending or perceived priority): (a) high incidence of crime, (b) drug trafficking, (c) proliferation of violent youth gangs, (d) pervasiveness of money laundering, and (e) frequency of domestic violence. In conducting the research for this present paper, we evaluated the nature of the evidence on the extent to which these perceived issues would rise to the level of being "significant," as well as the evidence on "what works" and what the benefits and costs are from programs that have been shown to be effective.

Setting the boundaries of our analysis was a difficult task, but one that we needed to do in order to arrive at a solutions document that would be of value to policy makers. For example, while most incidents of crime and violence are essentially "local," the causes and potential solutions to crime might lie well outside the local or even national jurisdiction. This is true globally – where many types of crimes are clearly of a global character and require more than local solutions.

There are several very stark examples of this problem in the case of crime and violence in Latin America. For example, the demand for drugs in the U.S. and Europe will have an impact on the supply of drugs in various Latin American countries – and hence will impact organized crime and gang-related violence. Because these markets operate outside of traditional legal institutions, enforcement of property rights disputes, for example, also take place outside normal legal channels – hence contributing to the demand for violence itself. Moreover, because the demand for drugs is coming outside of Latin America, any attempt to reduce the supply of drugs in one "hot spot" country in Latin America will ultimately backfire as drug production is shifted to another country to keep up with the demand. There is good evidence that this has happened repeatedly in Latin America. Thus, without global solutions, a Latin American solution to this problem is unlikely to succeed.

Drug and terrorism policy in the U.S. and Europe can also affect crime and violence in Latin America. For example, the U.S. war on drugs has led to the extradition of drug lords – something that has destabilized the Colombian drug market, for example, with the ultimate effect of more violence between organized drug cartels to gain control over local areas. This contrasts with the approach taken in Europe which is largely to treat drugs as a 'consumption' problem at home.

Similarly, some researchers have suggested that immigration and prison policies in the U.S. affect crime and gang-related violence in Latin America. For example, illegal immigrants who have committed crimes while in the U.S. will serve time in prison and then be deported to their home country. To the extent that returning prisoners have joined gangs in U.S. prisons and transfer knowledge and experience back to their home countries – this exacerbates the gang violence problem in the home country.

In this paper, we take these factors as exogenous and beyond the scope of our immediate concern – which is to identify the most cost-beneficial programs that can be implemented in Latin America to reduce crime and violence given the current situation and institutions within which we have to work.

Policy discussions over crime and violence in Latin America have oftentimes been framed using political and ideological themes. Thus, for example, calls for more police and tougher prison sentences are often seen as attempts by the "right" to control the underclass. Similarly, calls for prevention programs through better education, jobs, and an enhanced standard of living to reduce the desirability of illegal occupations are often seen as "socialist" solutions by the right. Given this political backdrop as well as the fact that the field of criminology itself has historical roots in sociology, there is scant empirical evidence on either the extent of criminal behavior or the effectiveness of prevention or control strategies in Latin America. Police records are notoriously poor – and often generated by corrupt politicians or police administrations to support their point of view. There have only been a few comprehensive victimization surveys in some countries, and any significant cross-country comparisons that can be made are of only limited value unlike more detailed surveys in the U.S. and Europe. There are also no reliable indicators of drugs or arms trafficking or the influence of organized crime. Measures of these problems are largely indirect and subject to considerable uncertainty. Thus, in the following section on the extent of crime and violence in Latin America, the uninitiated reader might be struck by the lack of solid data – but this is a persistent problem in measuring crime and violence.

B. Basic Facts on Crime & Violence in Latin America
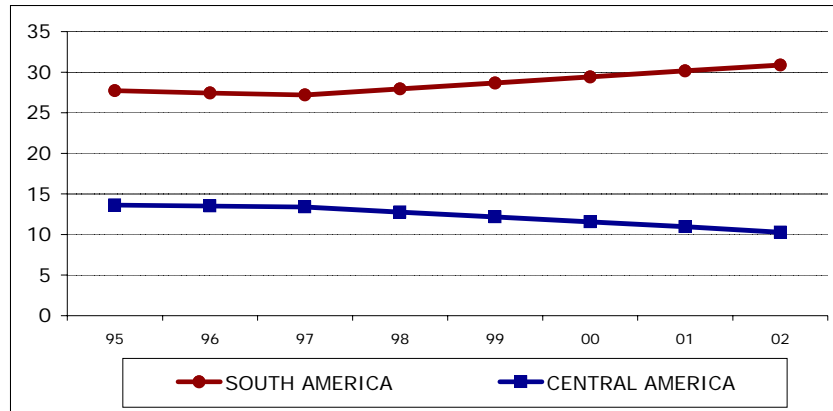
(1). Incidence of Crime and Violence

Although a recent rise in crime and violence in Latin America is almost taken for granted,[1] the available evidence is not conclusive. Moreover, existing sources of reported crime and violence data are often contradictory – sometimes oftentimes with no apparent method of reconciliation. Instead, if any pattern is clear, it is that crime and violence are highly variable across countries and even across localities within countries. Nevertheless, the evidence is clear that crime and violence in Latin America is a serious problem that has a significant impact on the health, well-being, and economic development of the region. In this section, we review the empirical evidence on crime and violence, to provide a context in which our solutions are being proposed.

For the period 1995-2002 the annual increase in homicides (2.1%) was slightly higher than the rise in population (1.6%) for Latin America as a whole.[2] However, this rise in homicides was concentrated in South America. In Central America, there was a continuous drop in homicide rates. This is shown in Figure 1;

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[1] WOLA (2006)
[2] OPS (2005)

Figure 1

HOMICIDE RATE - 1995 TO 2002

YEARLY HOMICIDES PER 100.000 PEOPLE

According to the Pan American Health Organization (PAHO-OPS) figures, the recent evolution of homicides varies among countries, as shown in Figure 2:
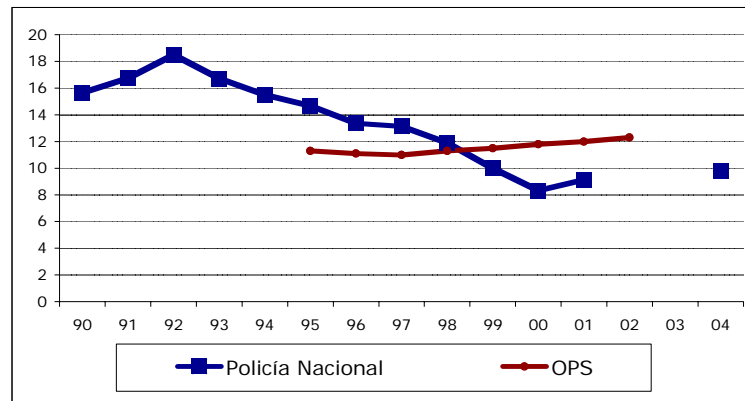
Figure 2

HOMICIDE RATE - 1995 TO 2002

	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	5,0	4,9	4,9	5,3	5,8	6,2	6,6	7,0
Brasil	26,6	27,3	28,1	28,7	29,2	29,8	30,4	31,0
Chile	2,9	2,9	2,9	3,4	3,9	4,3	4,8	5,3
Colombia	91,6	86,0	80,4	81,2	82,1	82,9	83,8	84,6
Costa Rica	5,4	5,5	5,6	5,7	5,9	6,0	6,1	6,2
Cuba	6,1	6,6	7,1	7,1	7,1	7,1	7,1	7,0
Ecuador	14,0	14,1	14,1	14,4	14,7	15,1	15,4	15,7
El Salvador	35,7	43,0	50,4	49,0	47,6	46,2	44,8	43,4
Guatemala	21,6	22,3	23,1	…	…	…	…	…
Honduras	0,0	…	…	…	…	…	…	…
México	17,1	16,4	15,7	14,8	13,9	13,0	12,1	11,1
Nicaragua	11,3	11,1	11,0	11,3	11,5	11,8	12,0	12,3
Panamá	11,1	11,1	11,1	11,6	12,1	12,6	13,2	13,7
Paraguay	15,6	16,4	17,3	17,5	17,7	17,9	18,1	18,4
Perú	6,2	5,3	4,5	…	…	…	…	…
Puerto Rico	22,8	22,6	22,4	21,7	20,9	20,2	19,4	18,7
R Dominicana	11,2	11,1	11,1	…	…	…	…	…
Uruguay	4,8	4,9	5,0	5,1	5,1	5,1	5,2	5,2
Venezuela	15,6	16,0	16,3	19,6	22,8	26,0	29,2	32,0

For Nicaragua, where PAHO-OPS figures show a small rise in homicide rates, official Policía Nacional figures show a decline from 1992 to 2000, as shown in Figure 3:
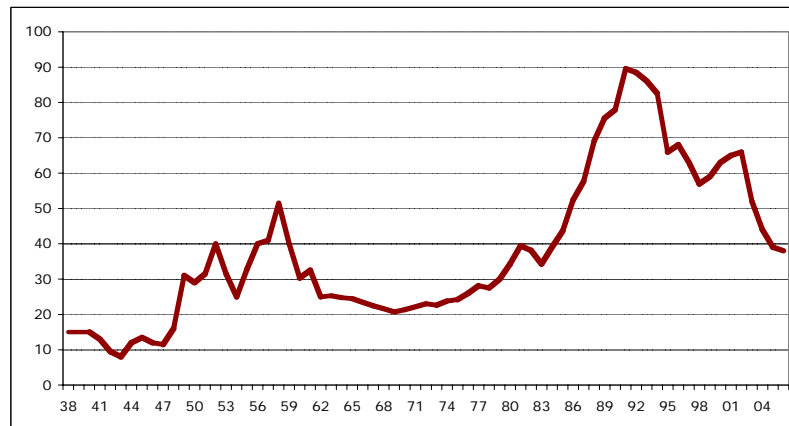
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Figure 3
HOMICIDE RATE - NICARAGUA 1990 - 2004

In some high violence countries, the rise in homicide rates is far from clear. For example, according to Policía Nacional data in Colombia, there has been a sharp and continuous drop since the 1990s, as shown in Figure 4.[3]

Figure 4
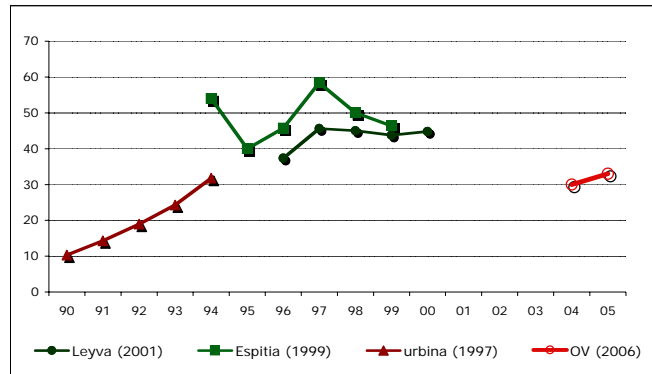**HOMICIDE RATE COLOMBIA - 1938 - 2005**

In Honduras, estimates of homicide rates differ but it is not easy to say that violence is on the rise. This is shown in Figure 5:
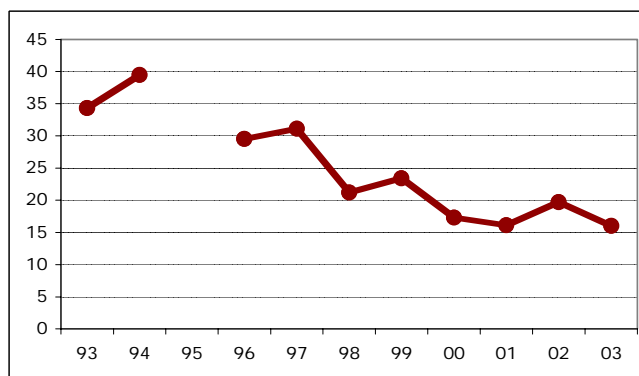
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[3] We area aware that there is a discrepency between the reported drop in homicidas in Colombia in this table and the PAHO-OPS data shown on the previous page that suggests there has been no such drop. While we believe the Policía Nacional data tend to be reasonably reliable, we have not been able to reconcile these figures with the PAHO-OPS data where we are uncertain about methodology or reliability. Nonetheless, this illustrates our points that (a) there is a lack of good data on crime and violence in Latin America, and (b) it is difficult to make reliable comparisons across countries or between Latin America and crime rates in other parts of the world.

Figure 5

HOMICIDE RATE - HONDURAS 1990 - 2005

In El Salvador, another high violence country, victimization rates show a continuous drop, as shown in Figure 6:

Figure 6

VICTIMIZATION RATE - EL SALVADOR 1993 - 2003

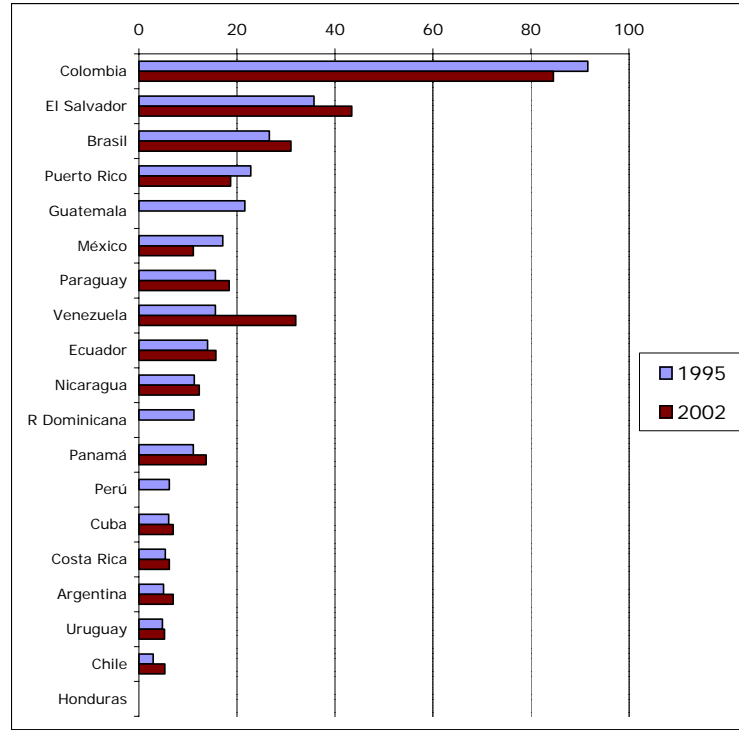Source: IUDOP - FESPAD (2004)

Despite this mixed picture, it is important to put the problem of violence into perspective relative to other countries. For example, the World Health Organization (WHO) estimates that the number of homicides committed with firearms in Latin America –between 73,000 and 90,000 a year– has reached three times the world average. Further, violence is the leading cause of death among Latin Americans between the ages of 15 and 44. The homicide rates reported above for the countries of Colombia, El Salvador, Venezuela, and Brasil are among the highest in the world. While it is even difficult to make world-wide comparisons of homicide rates – it is even more difficult to do so with non-fatal crimes and violence due to differences in definitions, reporting rates, and survey methodologies. Partly for that reason alone, homicide is often used as a barometer of overall crime and hence the best crime for such international comparisons.

(2). High Variance of Homicide and Violence Rates

More consistent with available information is the statement the crime and violence rates have a large variance both in time and space. For example, PAHO-OPS figures on homicide rates show ratios of almost 1 to 30, as shown in Figure 7. It is not

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easy to find such large differences across countries in any other social/economic indicator in Latin America. In Colombia, homicide rates were down almost 50% in one decade.

Figure 7

HOMICIDE RATE LATIN AMERICA - 1995 - 2002

YEARLY HOMICIDES PER 100.000 PEOPLE

Source: OPS (2005)

In urban areas, differences are just as big, as shown in Figure 8. For example, homicide rates in Recife, or Medellin are 10 or 20 times as high as those observed in Ciudad de Panamá, or Santiago or Buenos Aires.
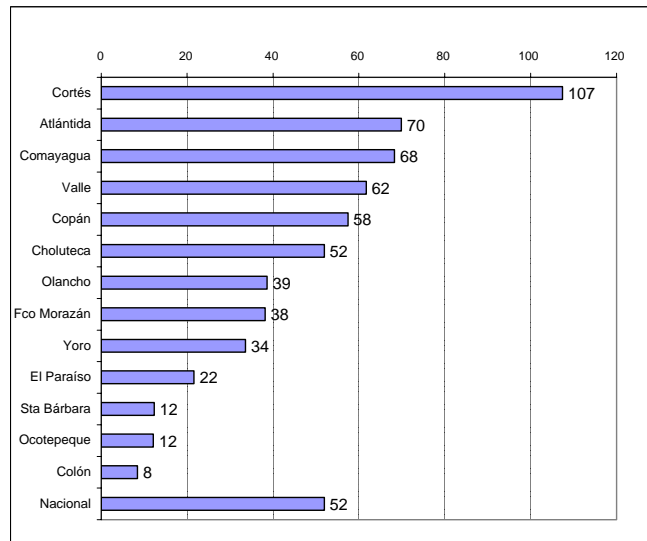
Even within a country, homicide rates depend highly on local factors. As shown in Figure 9, in Honduras, for example, the homicide rate by departamento varies from 107 in Cortés to 8 per 100,000 in Colón.
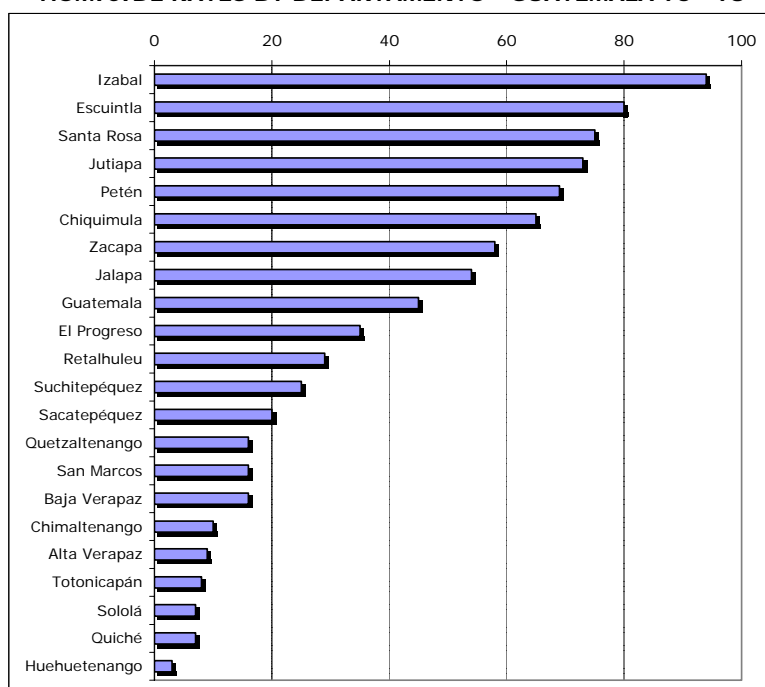
Figure 8
HOMICIDE RATES IN SOME CITIES

	0	20	40	60	80	100	120	140	160	180
Recife										
Medellín										
Ciudad de Guatemala										
San Salvador										
Cali										
San Pedro Sula										
Washington										
Sao Paulo										
Río de Janeiro										
Tegucigalpa										
Brasilia										
Salvador (Bahía)										
Porto Alegre										
Bogotá, D.C.										
Lima										
Curitiba										
Ciudad de México										
Quito										
Ciudad de Panamá										
Miami										
Santiago de Chile										
Buenos Aires										

Source: Mockus y Acero (2005)

Figure 9
HOMICIDE RATES BY DEPARTAMENTO - HONDURAS 2000
YEARLY HOMICIDES PER 100.000 PEOPLE

	0	20	40	60	80	100	120
Cortés						107	
Atlántida				70			
Comayagua				68			
Valle				62			
Copán				58			
Choluteca			52				
Olancho		39					
Fco Morazán		38					
Yoro		34					
El Paraíso	22						
Sta Bárbara	12						
Ocotepeque	12						
Colón	8						
Nacional			52				

Source: Leyva (2001)

Similar differences are found in Guatemala, as shown in Figure 10, where homicide rates range from less than 5 in Huehuetenango to more than 90 per 100,000 in Izabal.
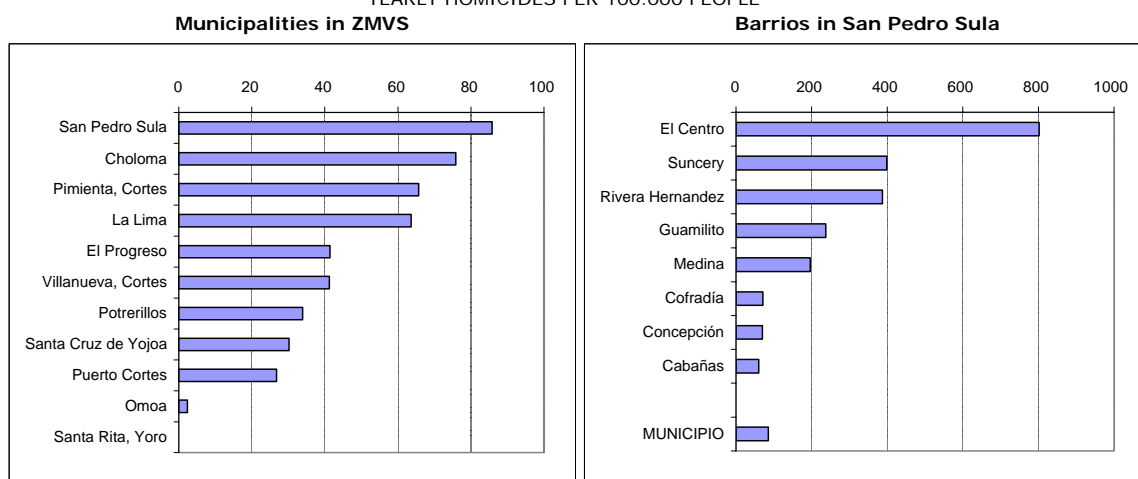
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Figure 10
HOMICIDE RATES BY DEPARTAMENTO - GUATEMALA 96 - 98

Source: BID - CIEN (2000)

Even in a small geographical area, or within a municipality, differences in the level of violence can be staggering. This is illustrated in Figure 11. For example, in San Pedro Sula, Honduras, homicide rates reach almost civil war levels. Yet, neighboring villages like Omoa or Santa Rita, show very small incidence of murders. Some barrios in San Pedro Sula show rates that are 4 or 8 times the city average.
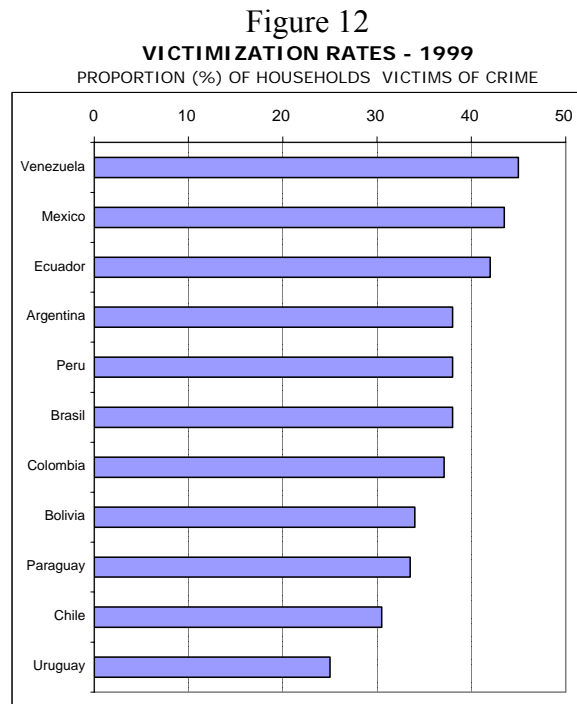
Figure 11
HOMICIDE RATES ZONA METROPOLITANA DEL VALLE DEL SULA (ZMVS) - HONDURAS 2000
YEARLY HOMICIDES PER 100.000 PEOPLE

Municipalities in ZMVS   **Barrios in San Pedro Sula**
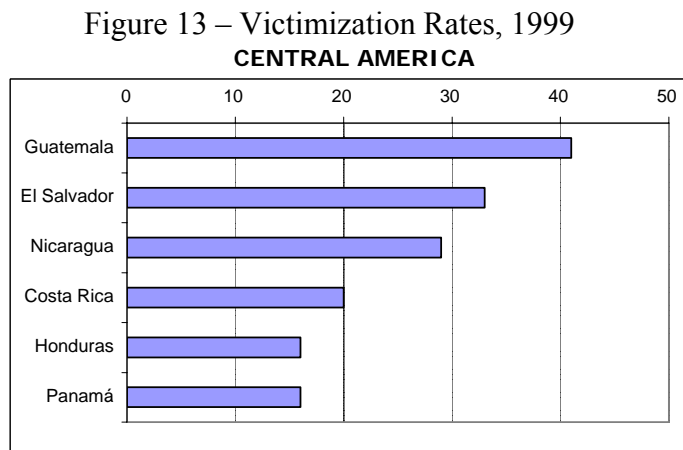

Source : Rubio y DIEM (2003)

Victimization rates also show some differences that do not always correspond to differences in homicide rates. Colombia, for example, has been the indisputable leader in homicides and kidnapping. However, as shown in Figure 12, Colombia

is behind Venezuela, Mexico, Ecuador, Argentina, Peru and Brasil in terms of non-fatal victimization.

Figure 12

VICTIMIZATION RATES - 1999

PROPORTION (%) OF HOUSEHOLDS VICTIMS OF CRIME

Source: Latinobarómetro - From Gavira y Pagés (1999)

Similarly, as shown in Figure 13, victimization rates in Honduras are lower than in Guatemala, Nicaragua and even peaceful Costa Rica.
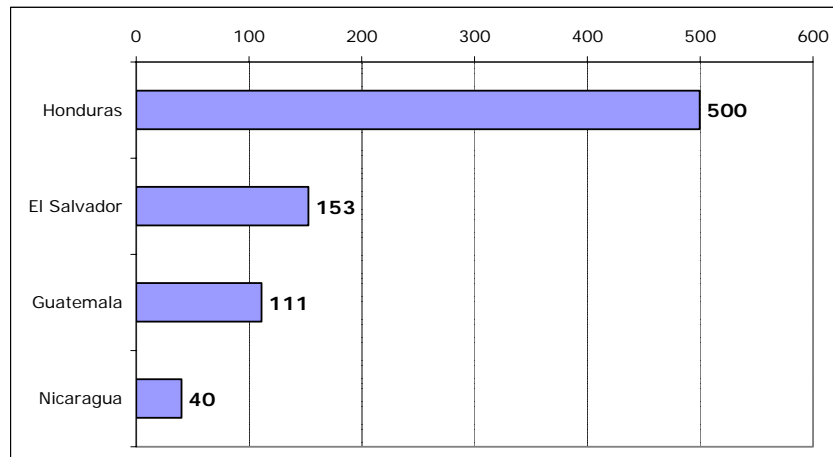
Figure 13 – Victimization Rates, 1999

CENTRAL AMERICA

Source: Barómetro Centroamericano from BID-CIEN (2001)

(3). Gang Membership

Gang membership in Central America shows the same pattern of high variance. As shown in Figure 14, according to estimates reported by USAID (2006) there are 500 gang members per 100.000 people in Honduras. In El Salvador the figure is 153, in Guatemala 111, and in Nicaragua 40.
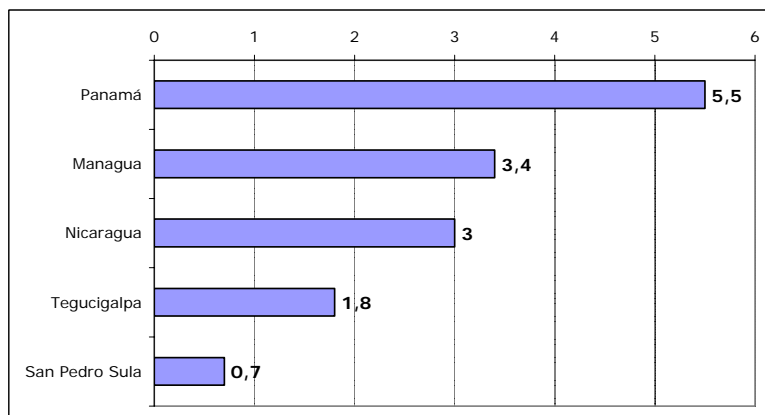
Figure 14
GANG MEMBERSHIP IN CENTRAL AMERICA
NUMBER OF GANG MEMBERS PER 100.000 PEOPLE

Country	Value
Honduras	500
El Salvador	153
Guatemala	111
Nicaragua	40

Source: Gang membership USAID (2006) - Population 2005   United Nations

According to recent random, representative self report surveys, gang membership among students varies from 5.5% in Panamá to less than 1% in San Pedro Sula (Rubio, 2007), as shown in Figure 15

Figure 15
GANG MEMBERSHIP AMONG STUDENTS
PROPORTION OF STUDENTS THAT REPORT BELONGING TO A GANG

City	Value
Panamá	5,5
Managua	3,4
Nicaragua	3
Tegucigalpa	1,8
San Pedro Sula	0,7

Source: Self report surveys - Rubio (2007)

Estimates of gang incidence from self-report surveys are quite different from those calculated from police records. According to the former, gang membership in Nicaragua is higher than in Honduras (Tegucigalpa & San Pedro Sula). However, according to police records, gang membership in Honduras is 10 times higher than in Nicaragua. Due to the difference in data collection methodologies, it is impossible to reconcile these discrepancies.

The problem of gang violence is further complicated by the possibility that some gangs in Latin America might be controlled by members in the U.S. – often in prison themselves. Moreover, it has often been stated that deportation of gang members and other violent offenders from U.S. prisons exacerbates the gang problem in Latin America as those who return to their home countries are more likely to
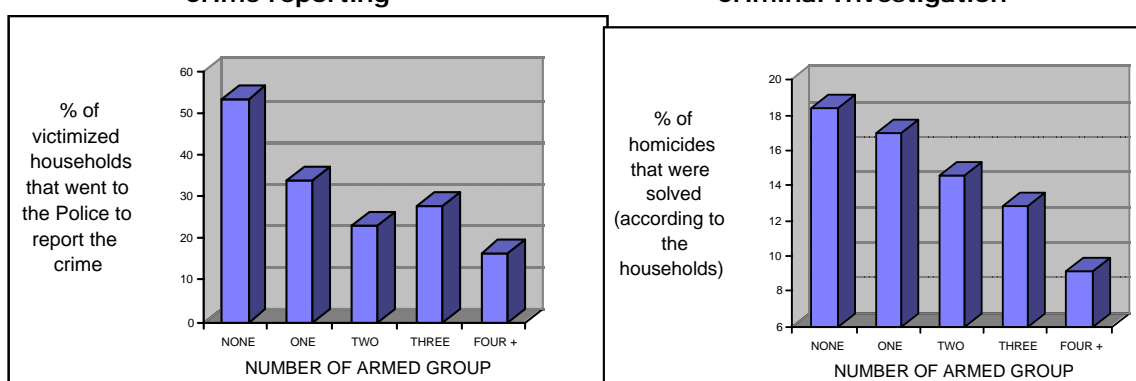
become active and dangerous gang members.[4] Recently, this view has been contradicted by several researchers (see e.g. WOLA, 2006). Regardless, the problem of gang violence is multi-faceted – and even if part of any ultimate solution involved dealing with these external political forces (e.g. immigration/deportation issues), the problem of youth gangs and violence will still persist. Ultimately, we focus on these internal problems of preventing youth violence in the community – as well as rehabilitation and re-entry of youth into a community once they have started down a path of crime. While international and/or other country policies might have an impact on gang activity in Latin America, we believe these programs, if implemented, will have a positive effect irrespective of these external factors.

(4). Offenders Mostly Young Men

Most crime and violence in Latin America seems to be committed by young men. However, it is difficult with available information to estimate the exact contribution of young men to violence, for many reasons. Since clearance rates are very low (i.e. number of arrests per committed offense), the profile of perpetrators is mostly unknown. Moreover, reporting rates are low relative to other parts of the world (Levitt and Rubio, 2000).

To make matters even more difficult, clearance and reporting rates are negatively associated with the levels of violence. If crime is very high, the criminal justice system, from prosecutors to judges to prisons, simply cannot keep up. Also, as criminals get more power, victims report less to official authorities. In Colombia, for example, a victimization survey made in regions under the influence of different illegal armed groups (e.g. guerrillas, paramilitary, narcos), showed that as violence gets worse, in terms of stronger influence of mafias, victims rely less on the official criminal justice system which, in turn, is less able to perform (see Figure 16).
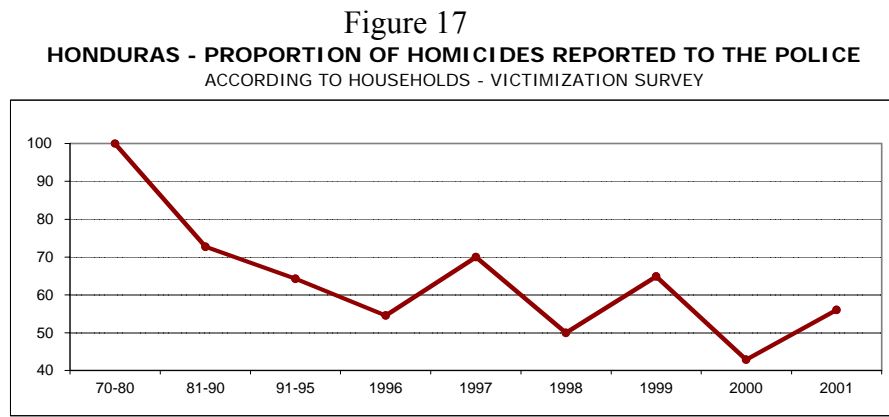
Figure 16

Colombia - Armed Groups Influence & Criminal Justice

Source: Cuellar (1997)

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[4] See for example "Somos la mano de obra del crimen organizado: las pandillas Centroamericanas", *El País* (Spain) May 10 2005. The *Economist* "After the massacre" , January 15, 2005. "Combating El Salvador's gangs" BBC News March 20 , 2004, "Derrière la violence des gangs du Salvador" *Le Monde Diplomatique* March 2004, "La lutte contre les gangs" e *Le Monde*, November 26, 2005, *Boston Herald* January 2005, *Washington Post*, July 2005.
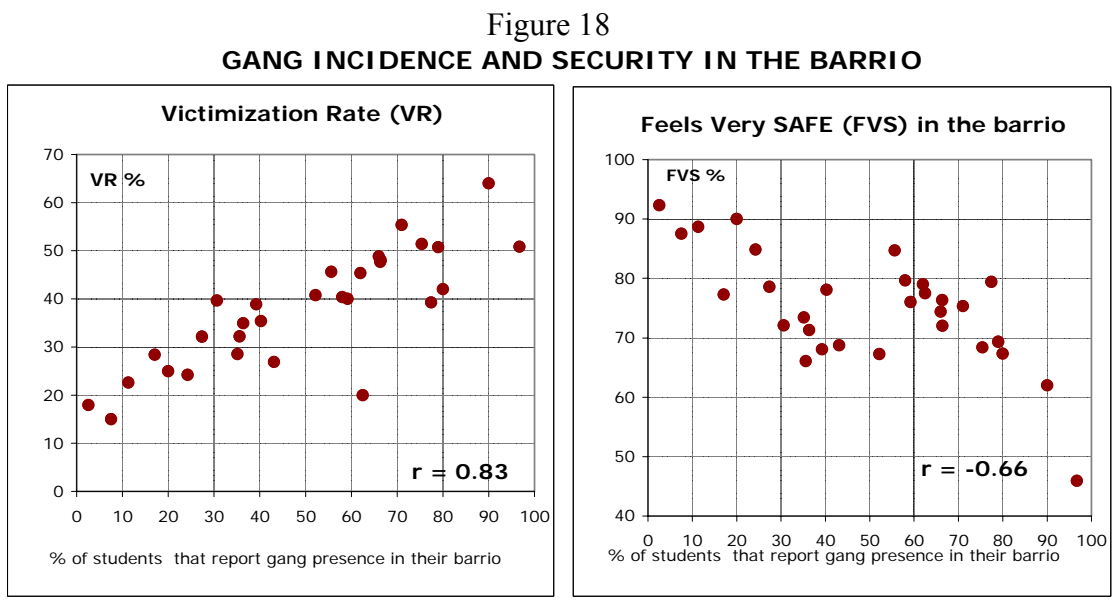
A similar pattern over time can be deduced from data on reporting of murders to the police in Honduras. As shown in Figure 17, as homicide rates went up during the 80s-90s, the proportion of cases reported to the police decreased.

Figure 17
HONDURAS - PROPORTION OF HOMICIDES REPORTED TO THE POLICE
ACCORDING TO HOUSEHOLDS - VICTIMIZATION SURVEY

Source: Rubio (2002)

This scenario of "no justice" or "private justice" instead of dealing with crime through the official criminal justice system can be relevant both in neighborhoods where organized crime and/or gangs have political control or where paramilitary regain it.

Some indirect evidence of the role that young people play in crime and violence is the strong relationship between gang presence in the barrios and insecurity – both victimization rates and feelings of safety among students, as shown in Figure 18.

Figure 18
GANG INCIDENCE AND SECURITY IN THE BARRIO

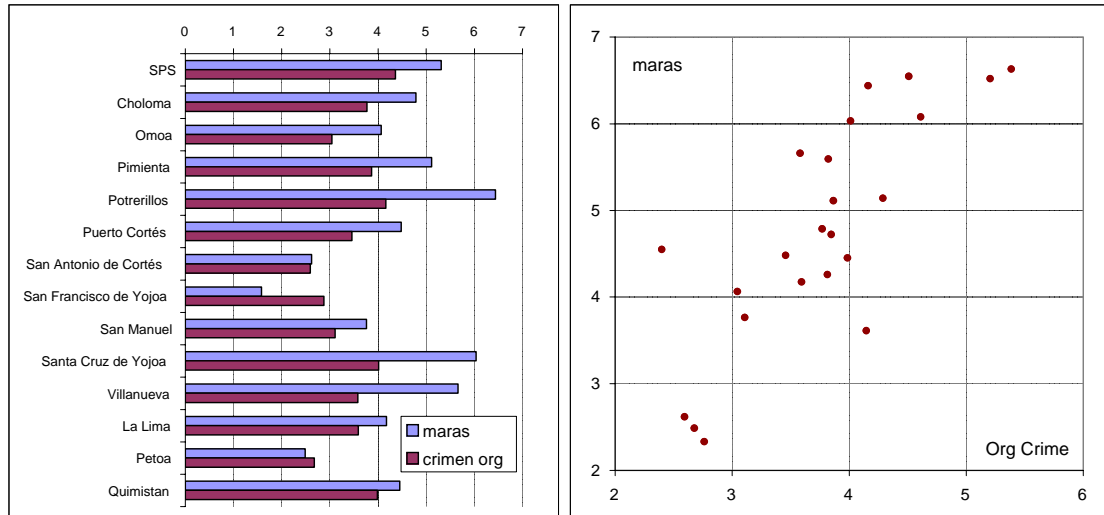Source: IADB Self report surveys - Data by municipalities - Rubio (2007)

In spite of the difficulty of assessing the share of young people in crime & violence, two facts seem corroborated by different kinds of evidence – testimonial, police records, victimization & self report surveys- : (i) youth gangs work closely with organized crime and (ii) among young people, the most serious violence is committed by gang members.

A random household victimization survey done in Honduras in which respondents were asked to rate – from irrelevant to very high- the influence of both maras –gangs in Central America - and organized crime shows how closely related both of these phenomena are. This is shown in Figure 19.

Figure 19
MARAS (GANGS) & ORGANIZED CRIME IN HONDURAS
AVERAGE INDEX OF INFLUENCE BY MUNICIPALITIES

Source: Rubio (2002)

The same type of scenario has been found in Cali and Medellín in Colombia.

The IADB self-report surveys done in Central America show that gang membership significantly increases the probability of a young person committing an offence (Rubio, 2007). The difference between the frequency of offending among gang members and students varies across the sample, but is always higher than 50 percent, as shown in Figure 20. It seems to be higher where gangs are highly organized. Such is the case of the maras in Honduras (Tegucigalpa & ZMVS).

Figure 20
FREQUENCY OF OFFENDING - GANG MEMBERS & STUDENTS *
PROPORTION OF RESPONDENTS THAT SELF-REPORT AT LEAST ONE OFFENCE

* Students that do not belong to a gang
Source: IADB Self -report surveys - Rubio (2007)

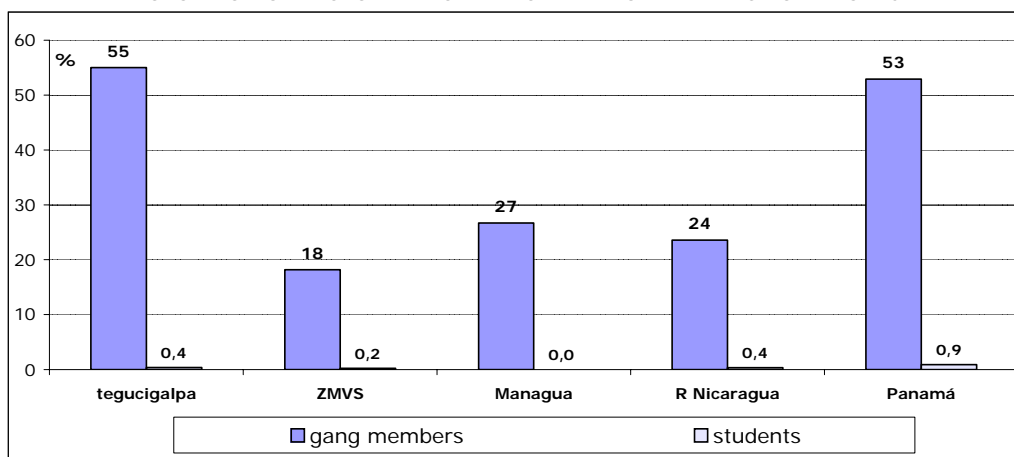For serious offences, such as homicides, the difference between gang members and students is larger. Gangs almost monopolize extreme violence among young people. As shown in Figure 21, the incidence of homicide among gang members can be quite high: 55% in Tegucigalpa and 53% in Panamá.

Figure 21
SELF-REPORT OF HOMICIDE * - GANG MEMBERS AND STUDENTS
PROPORTION OF RESPONDENTS THAT SELF-REPORT AT LEAST ONE HOMICIDE

* includes serious injuries
Source: IADB Self -report surveys - Rubio (2007)

There is a lot of evidence that relates high homicide rates with illegal markets, especially with drugs (see Levitt and Rubio, 2000). So it does not come as a surprise that high self-report of homicides is closely associated with drug selling among young people. This kind of offence is also concentrated in gang members, as shown in Figure 22.

Figure 22
SELF-REPORT SELLING OF DRUGS - GANG MEMBERS AND STUDENTS
PROPORTION OF RESPONDENTS THAT SELF-REPORT AT LEAST ONE HOMICIDE

Source: IADB Self -report surveys - Rubio (2007)

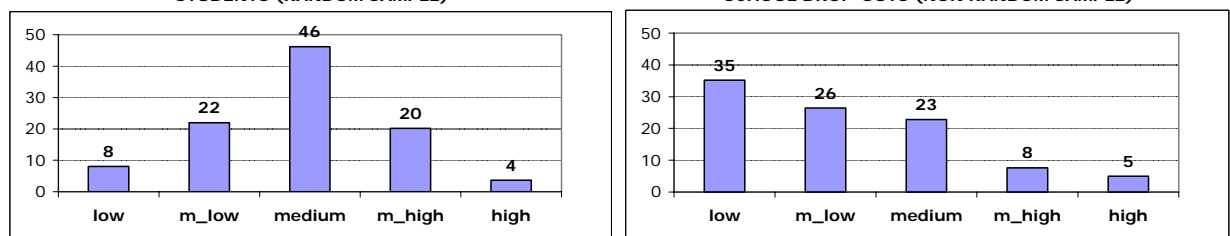## (5). Risk Factors for Juvenile Delinquency and Gang Membership

According to a recent report on gang violence in five countries studied in Latin America (El Salvador, Guatemala, Honduras, Mexico, and Nicaragua):

The root causes of gang activity in the five countries are similar— marginalized urban areas with minimal access to basic services, high levels of youth unemployment compounded by insufficient access to educational opportunities, overwhelmed and ineffective justice systems, easy access to arms and an illicit economy, dysfunctional families, and high levels of intra-familial violence. A demographic youth bulge has created a cohort of youth without jobs, decent education, or realistic expectations of employment. The four Central American countries have a combined total population of nearly 30 million people and approximately 60 percent are under 25 years old. The Mexican states assessed (Chiapas, Baja California, Chihuahua, and Tamulipas) have an estimated population of 9.6 million people and nearly 50 percent are under 25 years old. Underemployment and unemployment ranges from less than 20 percent in Guatemala, to about 25 percent in Mexico, to over 50 percent in the remaining three countries. Although many of these youth represent untapped economic potential for their countries, they face a much bleaker future than their parents did at the same age. USAID (2006), p. 17.

The above study correctly paints violence and gang membership in Latin America as a complex social issue. While it might be "common knowledge" to many that poverty itself is a strong risk factor for gang membership and juvenile delinquency, the facts suggest that this finding may be partially a consequence of sampling bias error. Normally, gang studies have limited their field work to low income barrios. In the IADB self report surveys (Rubio, 2007), a random sample of students, representative of all income strata was taken. Also, a non random sample of school drop outs was taken looking for gang members to answer the same questionnaire that was applied to the control group of students.

As shown in Figure 23, the distribution of the perceived social class among students was, as expected, a normal distribution. Among school drop outs, a higher percentage of respondents perceived themselves as belonging to the lower strata.

Figure 23

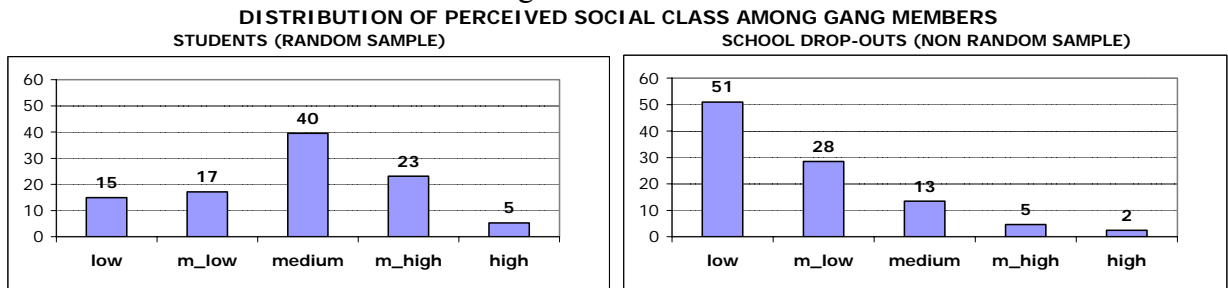DISTRIBUTION OF PERCEIVED SOCIAL CLASS - STUDENTS AND SCHOOL DROP-OUTS

Source : IADB Self - report Surveys

These distributions are very similar among gang members, as shown in Figure 24. For those that are still in school, the social class distribution is almost an inverted U-shaped normal distribution. Only among gang members that dropped out of school is there a higher participation of lower strata.
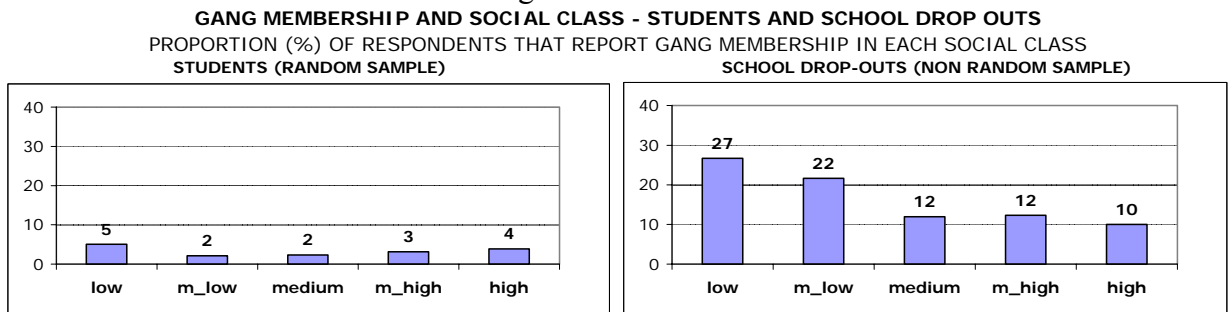
Figure 24
DISTRIBUTION OF PERCEIVED SOCIAL CLASS AMONG GANG MEMBERS

STUDENTS (RANDOM SAMPLE)	SCHOOL DROP-OUTS (NON RANDOM SAMPLE)

Source : IADB Self - report Surveys

So it is not surprising to find that among students, gang membership is almost independent of social class. Only in the non random sample of school drop outs can one find a negative relationship between social class and gang membership. Similar results are found using other variables of economic background (see Figure 25).

Figure 25
GANG MEMBERSHIP AND SOCIAL CLASS - STUDENTS AND SCHOOL DROP OUTS
PROPORTION (%) OF RESPONDENTS THAT REPORT GANG MEMBERSHIP IN EACH SOCIAL CLASS

STUDENTS (RANDOM SAMPLE)	SCHOOL DROP-OUTS (NON RANDOM SAMPLE)

Source : IADB Self - report Surveys

So poverty does not look like a necessary condition for gang membership. Lower income gangs have gotten more attention probably because they are more visible in the streets. Dropping out of school, which is likely related to poverty, looks like a stronger risk factor than poverty by itself. However, it is not possible to quantify the impact of dropping out on gang membership. The sampling method used for these surveys surely over emphasizes its effect.

On the other hand, poverty is far from being a sufficient condition for gang membership. The vast majority of the poorest students in the sample do not belong to a gang even if there is one in the barrio. As shown in Figure 26, even when poor young boys live in a barrio with gangs and report having friends in a gang, a high proportion of them (80%) are not gang members. However, a combination of poverty and dropping out of school does appear to be a high risk factor for gang membership.

Figure 26
POOR YOUNG PEOPLE OUT OF GANGS
PROPORTION (%) OF RESPONDENTS IN THE LOWER CLASS THAT DO NOT REPORT GANG MEMBERSHIP
FOR DIFFERENT KIND OF CONTACT WITH GANGS

Source : IADB Self - report Surveys

Finally, domestic violence has been repeatedly identified as a risk factor of juvenile violence. Self-report surveys also corroborate this claim, as shown in Figure 27:

Figure 27
GANG MEMBERSHIP AND DOMESTIC VIOLENCE
PROPORTION (%) OF RESPONDENTS THAT REPORT GANG MEMBERSHIP FOR DIFFERENT TYPES OF DOMESTIC VIOLENCE

Source : IADB Self - report Surveys

(6) Domestic violence rates are high

While the evidence is based on a few surveys in selected locations, there appears to be ample evidence that domestic violence rates are high in Latin America. As reported in UNICEF (2000), for example, 11% of women surveyed in a representative sample in Santiago, Chile reported at least one episode of "severe violence" by a partner, while an additional 15% reported at least one episode of less severe violence. In Colombia, a survey of over 6,000 women reported being physically assaulted by their partner at some point in their lifetime. In a 1997 survey of 650 women in Guadalajara, Mexico, 30% reported at least one episode of physical violence by a partner, with 13% reporting physical violence during the past year. Finally, in a 1996 representative sample of women in León, Nicaragua, 52% reported being physically abused by a partner at least once, with 27% reported within the past year.

While these rates are high, there is no systematic data available by which we could judge the relative severity of the domestic violence problem in Latin America compared to elsewhere. In fact, even when there is evidence of an increase in domestic violence, it is oftentimes unclear whether that represents more domestic violence or more reporting. Nevertheless, there is evidence that the costs are high. Domestic violence not only takes the form of physical or sexual abuse against a partner, but also commonly against children. Even when children are not direct victims, they oftentimes become indirect victims upon witnessing their parent's abuse.

The consequences of domestic violence are varied and can be extremely harmful and costly to society. In addition to physical harm, medical costs, and lost wages, victims often suffer severe psychological harm. However, there is little documentation of the social costs of domestic violence in Latin America. Further, the only evidence to date is correlational – not causal. One study of more than 300 women each in Santiago, Chile and Managua, Nicaragua found strong evidence that victims of domestic violence had significantly lower earnings than women who were not victimized – with potential losses in productivity being as high as 2% of GDP (Morrison and Orlando, 1999, 66). However, findings were mixed with respect to the impact on employment and health care utilization. A study by Ascencio (1999) in Mexico City included data from vital statistics from 1990-1995 along with death certificates on cause of death, files on autopsies, and surveys with victims of non-fatal domestic violence. Ascencio estimated the total disability adjusted life years ("DALY") from domestic violence including number of days of life lost, plus non-fatal losses of reproductive health, sexually transmitted diseases, and psychological health.[5] He estimated that lost DALYs in Mexico City in 1995 totaled 27,200 – 53% from physical injury and 47% from nonphysical injury. In fact, this totaled 8.1% of total DALY losses for women in Mexico City – the third leading cause of lost DALY behind diabetes and birth-related disorders. Particularly hard hit were young girls under age 5 and women of child-bearing years.

Domestic violence - especially sexual abuse of children - has been found to be a significant risk factor for gang membership, youth crime and prostitution in Central America (Rubio, 2007). Thus, the value of preventing child abuse has important positive spillovers beyond the benefits to the child's immediate welfare.

Studies outside Latin America also find domestic violence to be a huge share of the problem of violence. For example, a study in the U.S. concluded that the cost of child abuse and domestic violence accounted for nearly 30% of the cost of crime (Miller, Cohen, Wiersema, 1996). Given the fact that domestic violence rates appear to be as high if not higher in Latin America, we would not be surprised to find similar results.

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[5] The DALY is a measure of the health gap that includes both the number of life years lost due to premature death as well as the number of years in which an individual is in a poor health state. For a complete definition, see World Health Organization, http://www.who.int/healthinfo/boddaly/en/index.html.

II. PROPOSED SOLUTIONS

The most comprehensive review of the evidence on "what works" in criminal justice and prevention programs was published in 1997 by Sherman et al., following the commission of a comprehensive study by the U.S. Congress.

Sherman et al. (1997, 1998) undertook a very comprehensive review of the existing literature on crime prevention program effectiveness. They examined hundreds of studies to determine the strength of scientific evidence and whether or not one could draw conclusions about the effectiveness of individual programs. The study included:

Community-Based Crime Prevention - such as community organizing and mobilization against crime, gang violence prevention, community-based mentoring, and after-school recreation programs.

Family-Based Crime Prevention - such as home visitation of families with infants, preschool education programs involving parents, parent training for managing troublesome children, and programs for preventing family violence, including battered women's shelters and criminal justice programs.

School-Based Prevention - such as DARE, peer-group counseling, gang resistance education, anti-bullying campaigns, law-related education, and programs to improve school discipline and improve social problem-solving skills.

Labor Markets and Crime Risk Factors – such as training and placement programs for unemployed people, including Job Corps, vocational training for prison inmates, diversion from court to employment placements, and transportation of inner-city residents to suburban jobs.

Preventing Crime At Places – the effectiveness of practices to block opportunities for crime at specific locations like stores, apartment buildings and parking lots, including such measures as cameras, lighting, guards and alarms.

Policing For Crime Prevention - such police practices as directed patrol in crime hot spots, rapid response time, foot patrol, neighborhood watch, drug raids, and domestic violence crackdowns.

Criminal Justice and Crime Prevention - such as prisoner rehabilitation, mandatory drug treatment for convicts, boot camps, shock incarceration, intensively supervised parole and probation, home confinement and electronic monitoring.

Sherman et al. (1997) reviewed each study and classified the strength of the evidence based on the scientific rigor in conducting the study. Unfortunately, they concluded:

Very few operational crime prevention programs have been evaluated using scientifically recognized standards and methodologies, including repeated tests under similar and different social settings. Based on a review of more than 500 prevention program evaluations meeting minimum scientific standards, the report concludes that there is minimally adequate evidence to establish a provisional list of what works, what doesn't, and what's promising. (Sherman, 1998)

Unfortunately, most of the evidence that Sherman et al. found was in the U.S. and to a lesser extent in the U.K. or Europe. There is even less systematic information available in Latin America, as programs are often carried out by different agencies and NGOs, with no coordination at all. The few programs that have been evaluated or reported on as being promising have not had the benefit of independent reviews and thus should not be considered as reliable evidence. Indeed, it is not easy to find even a rough inventory of what is being done.

From their extensive analysis, Sherman and his colleagues drew numerous conclusions about what program works, what doesn't and what's promising. They developed a consistent set of criteria to evaluate the scientific rigor of each study. Studies were rated based primarily on three factors:

o Control of other variables in the analysis that might have been the true causes of any observed connection between a program and crime.

o Measurement error from such things as subjects lost over time or low interview response rates.

o Statistical power to detect program effects (including sample size, base rate of crime, and other factors affecting the likelihood of the study detecting a true difference not due to chance).

Before declaring that a program "works" or "doesn't work," they required two or more evaluations of a reasonably high quality along with the preponderance of other evidence. In some cases, where they had only one such study but significant other evidence pointing in that direction, they determined that a program "looks promising."

Sherman et al. (1997) did not attempt to quantify cost-benefit ratios, however, and instead focused on which programs had adequate scientific evidence to determine that they "worked." More recently, Steve Aos and his colleagues at the Washington State Institute for Public Policy (WSIPP) have systematically reviewed the literature and conducted a meta-analysis of program effectiveness studies. They have largely followed and updated the work of Sherman et al as well as augmented this information with additional data. Indeed, they have gone beyond the Sherman work by modeling the costs and benefits of each program. While one might disagree with certain assumptions that had to be made throughout the process, it is a very transparent approach and researchers can both replicate and conduct sensitivity analyses with their model. More importantly, it provides a consistent framework from which policy makers can compare programs that all have the same basic goal of reducing crime. For purposes of this paper, the Aos methodology is especially useful

since we have been able to directly compare the costs and benefits of a myriad of programs designed to reduce crime and violence.

Based on the analysis conducted by Aos and our review of the literature, the following programs are considered to have the highest benefit-cost ratio and to be most appropriate to the identified problems and potential solutions for the Latin American context:

SOLUTION 1: Comprehensive programs targeting at-risk mothers and young children under age 5.

There is growing evidence that behaviors learned and reinforced in early childhood can have significant consequences throughout an individual's lifetime. Accordingly, certain programs targeting the youngest children who are at-risk for child abuse, neglect, and lack of proper social skills reinforcement have been shown to reduce subsequent juvenile and adult offending behavior. These programs often have additional benefits such as improved high school graduation rates, reduced substance abuse, and other positive social outcomes. Two programs appear to be particularly beneficial and cost-effective. The first program targets low income, pregnant women and very young children from birth to age two, while the second program targets very young children age 3 and 4.

The program targeting young mothers was developed in Colorado and tested through a randomized control study involving 735 pregnant women (Olds et al., 2002). The program involves approximately 27 home visits by trained nurses (in the trial, there were an average of 6.5 visits during pregnancy and 21 visits from birth through age 2). In addition to a control group, one third of participants received visits by paraprofessionals. Only those who received visits by nurses, however, showed any significant effects. Among the benefits noted were better prenatal care (e.g. reduced smoking or other risky behavior, more use of health care services, etc.), fewer subsequent pregnancies, improved educational achievement and workforce participation by the mothers, better mother-infant interactions, improved family home environment, as well as improvements in the child's emotional and developmental well-being (e.g. language and mental development, temperament, behavioral problems). This program is particularly well suited to Latin America, given the very high rate of low income single-mother households – the group that is targeted by the program.

The second program picks up where the first one ends, by focusing on very early childhood education for children in low-income families. Well known examples of such programs in the U.S. include pilot/demonstration programs such as Perry Preschool Project (see Bartlett, 1993) and large scale programs such as Project Head Start. Aos et al. (2004) conduct a meta-analysis of over 50 studies of these programs. Although features of these programs vary and this is not the venue to analyze them in detail, all of the programs target low-income three and four year old children and bring them into a classroom setting. Benefits of these programs include lower incidence of child abuse and neglect, higher graduation rates from high school, and lower delinquency and long-term adult offending behavior.

SOLUTION 2: Comprehensive program to deal with youth and gang violence.

While not all gangs are the same in terms of their root causes, extent of violence, age ranges, etc., all gangs recruit from the pool of available youth in a community. This is particularly true in Latin America, since the high school drop out rate is so high and there is a large pool of youth from which gangs can recruit. One obvious solution beyond the scope of this paper is to increase the high school graduation rate – something that will have numerous benefits including lowered crime rates. However, since crime reduction is a secondary byproduct of such a program, and education is the subject of another paper, we do not focus on that solution. Clearly, however, any successful program that increases graduation rates will have some crime reduction benefits.

Aside from educational programs, several model programs in the U.S. have been found to significantly reduce gang violence and membership. These programs are coordinated interagency efforts that involve considerable integration of activities across police, courts, schools, social service agencies, and community groups . Perhaps the most well known and successful model was instituted in Boston (see Piehl et al., 2001). The scope of the Boston youth gang project was all encompassing, with participation by the local police, state juvenile justice corrections, probation and parole agencies, the district attorney, the U.S. Bureau of Alcohol, Tobacco and Firearms, as well as numerous community and clergy groups.

As described in Piehl et al. (2001), Boston used a two prong approach - starting with a crackdown on trafficking of illegal handguns to youth. The second prong was to communicate and confront gang members directly. Formal meetings were held in community centers, juvenile detention centers for those under supervision, and elsewhere between police, community leaders, and gang members. The message was clearly communicated that gang violence would not be tolerated and that there would be a severe crackdown. This crackdown would focus on the worst offenders, gang leaders, etc. At the same time, there would be a positive offer of assistance to others who were not the most violent offenders – job training and assistance and other social services. A group of clergy and other community workers made themselves available to work with these youth. This approach appears to have provided an 'out' for many youth who were on the verge of becoming more severe offenders.

While the details of each program vary, and Boston's approach might not be applicable to all cities (e.g. the focus on the availability of illegal handguns to youth would not be appropriate if guns were not widely available in one jurisdiction), there are several important lessons to be learned from the Boston experience. First, there is value in implementing a community-based problem solving approach to a solution. In Boston, a working group was established consisting of members of all agencies interested in youth violence. This working group met regularly to assess the nature of the youth gang problem in their community as well as to coordinate a response that was tailored to their city's needs. Second, it is clear that the multi-prong approach whereby there is both a carrot and stick works best. Cracking down on gang violence will not solve the underlying problems of troubled youth looking for an outlet. Thus, a successful program must "get tough" in conjunction with a program designed to rehabilitate and encourage youth to go down a better path. The comprehensive

approach we recommend has also been reviewed and advocated in a USAID report on gangs in Central America and Mexico (USAID, 2006).

While we believe a comprehensive, community-based, gang violence program might be appropriate in some communities, it will not work everywhere – and could in some cases be counterproductive. Any program needs to be tailored to local needs – taking into account the relationship between schools, community leaders, and governmental institutions. In fact, this point is consistent with the Boston approach, whereby there was ongoing dialogue among community members about the source of problems and the best possible solutions. Moreover, as researchers on gang violence have cautioned, sometimes drawing attention to gangs only reinforces their existence and legitimacy in the minds of local community youth – in other words, it can make matters worse. This might be a particular problem in some communities where gangs serve as protection for many community members.

Beyond the comprehensive gang-control model described above, according to Sherman et al. (1997), the following specific treatment programs have been shown to "work:"

- Various comprehensive, school-based programs have been shown to reduce delinquency and crime, such as: building capacity to initiate and sustain innovation; and communicating norms about behavior through rules, reinforcement of positive behavior, and school-wide initiatives (such as antibullying campaign) . [We note that in the context of Latin America, even more basic needs to maintain school building infrastructure could be of value in providing a safe, secure, school environment.]
- Social competency skills curriculums, such as Life Skills Training, which teach over a long period of time such skills as stress management, problem solving, self-control, and emotional intelligence, reduce delinquency and substance abuse .
- Training or coaching in thinking skills for high-risk youth using behavior modification techniques or rewards and punishments reduces substance abuse.
- "Schools within schools" programs such as Student Training Through Urban Strategies (STATUS) that group students into smaller units for more supportive interaction or flexibility in instruction have reduced drug abuse and delinquency.
- Job Corps, an intensive residential training program for at-risk youth, in one study reduced felony arrests for 4 years after participants left the program and increased earnings and educational attainment, although it also produced higher rates of misdemeanor and traffic arrests.
- Family therapy and parent training about delinquent and at-risk preadolescents reduce risk factors for delinquency.
- Rehabilitation programs for juvenile offenders using treatments appropriate to their risk factors reduces their repeat offending rates.

In addition, however, there were other programs shown to be "promising" based on preliminary evidence and theory – but did not pass the strict tests of Sherman et al. In many cases, that meant that there was only 1 study of sufficient quality as well as additional collaborative evidence – but not enough to pass their test of "what works." Some of the programs appear to have a positive benefit-cost ratio

based on the further (and more updated) analysis by Aos et al. (2004, 2006). In particular, Sherman et al. (1997) found the following programs to be "promising:"

- Community-based mentoring by Big Brothers/Big Sisters of America substantially reduced drug abuse in one experiment, although evaluations of other programs with mentoring as a major component did not.
- Community-based afterschool recreation programs may reduce juvenile crime in the areas immediately around the recreation center. Similar programs based in schools, however, have failed to prevent crime.
- Intensive supervision and aftercare of minor juvenile offenders, primarily status offenders like runaways or truants, reduced future offending. The finding held true for first offenders but not for those with prior delinquency in one experiment.
- Intensive supervision and aftercare of serious juvenile offenders in a Pennsylvania program reduced rearrests compared to putting offenders on probation.
- Gang offender monitoring by community workers and probation and police officers can reduce gang violence, although similar programs can increase gang crime if they increase gang cohesion.

In analyzing the various programs that have been proposed and evaluated, we took into account the best available research on costs and benefits, as well as how the existing programs might be adapted to the Latin American situation. For example, certain school-based programs might be particularly difficult to implement in a decentralized manner due to lack of adequate teaching staff. Pilot programs, centralized training and staff, and other modifications like this would likely be needed to successfully implement many of these programs in the Latin American context.

We focus on several programs that target juvenile offenders that have been found to significantly reduce recidivism and other socially costly outcomes such as high school drop out and drug abuse. These programs all involve some form of intensive monitoring/supervision of the offender and include involvement by the family and/or community in a meaningful way. Based on our review of the literature, we have chosen three such programs as models by which a comprehensive program could be developed and adopted in conjunction with the crackdown on gang violence mentioned above. These programs have been validated in numerous studies and have also been analyzed in the meta-analysis conducted by Aos et al. (2004). Of course, implementing these programs in Latin America would likely require some amount of tailoring and modifications – and would best be approached slowly through pilot testing.

One program, called "Functional Family Therapy" involves a systematic family intervention with regular visits by a trained counselor (see www.fftinc.com). This program has been used successfully with at-risk youth ages 10-18 with alcohol, drug abuse, and/or delinquency issues. In some cases the program is administered through a juvenile court, but that is not a necessary component. The second program, "Adolescent Diversion Project," involves a diversion from juvenile court (usually for first time offenders) whereby a youth is prevented from being labeled a delinquent (see Smith et al., 2004) . Youth are matched up with trained mentors who work with them on behavioral changes. While most criminal justice systems in Latin America

already have something like this in place, where first time offenders are diverted from the courts, the program we advocate requires strong involvement by trained mentors and adequate monitoring. The risk of not doing this well – i.e. simply diverting first time offenders into an alternative with some form of minimal supervision – is that this could make matters worse by "identifying" good prospects for gang recruitment.

The third program, called "Aggression Replacement Training" targets aggressive adolescents and children, and teaches them pro-social behaviors, anger control, and moral reasoning (see www.uscart.org/new.htm) . In both this case, as well as the functional family therapy program, there will be a need to build the infrastructure for identifying participants in addition to the actual program itself. In other words, there needs to be adequate training and awareness by school officials, for example, to identify at-risk children who could benefit from these programs. Then, the students can be treated by trained professionals – whether based in the schools or elsewhere in the community.

While other programs have been found promising, we have chosen those with the highest benefit-cost ratio and that are most likely to fit in to the needs and abilities of the Latin American context. The only program Aos et al. (2004) identified targeting youth violence with a higher benefit-cost ratio is a set of programs they call "interagency coordination programs." These programs are "wrap-around" efforts to coordinate existing community services on an individualized basis for juvenile offenders. Given the dearth of existing social service programs in most Latin American communities, we do not believe this program is widely applicable in our context. Thus, we have not included this in our list of recommended solutions.

An important issue we believe is worth mentioning in the context of youth violence is that "where" attention and resources are placed might be as important as "what" programs are instituted. We note that in most cases resources have flowed to the worst areas and the highest risk youth – with virtually no chance of success. This is problematic for two reasons. First, in some areas, gang control and violence is so pervasive that nothing short of military-type action will likely have an effect. Tackling individual youth issues one-on-one might not only be "too little too late" for these areas, it is much less likely to be effective even on an individual basis in such a "war zone." Second, we note that targeting resources to the very worst areas while ignoring those where there are strong community ties and the rule of law exists, sends the wrong signals about the availability of government assistance. **We believe that a higher success rate and higher benefit-cost ratio could be obtained by better targeting resources into communities where the likelihood of success is highest – which unfortunately, might not always be those communities with the most "need."**

SOLUTION 3: Comprehensive Prison Treatment and Reintegration Program.

Offenders who are released from prison have extremely high recidivism rates. Thus, programs that target these offenders while in prison can have a high payoff if they are successful in reducing recidivism. Three such programs – if implemented correctly – have been shown to reduce recidivism: (a) drug treatment, (b) educational and vocational programs, and (c) cognitive behavioral therapy. While these programs have been found to be effective, additional benefits may accrue when similar (and

additional) programs extend to offenders upon their release from prison – to assist in their reintegration into society.

While reintegration programs are relatively new, a comprehensive study (including a benefit-cost analysis) was recently conducted of a successful program in Baltimore, Maryland. According to Roman et al. (2007: 1-2), the Reentry Partnership Initiative (REP):

> …was designed as a community-justice partnership in which public agencies and community based organizations work together to provide continuous case management as prisoners transition into the community. The REP model addresses prisoner reentry needs at three levels: *individual*, *community*, and *systems*. At the individual level, returning prisoners are matched to social and medical services tailored to their needs and designed to help them successfully reintegrate into the community. Services are delivered by community-based organizations, which also seek to strengthen returning prisoners' support networks, enhance informal social controls within the target neighborhoods, improve community service availability and accessibility, and increase offender accountability. At the systems level, REP brings together corrections agencies and community service providers to coordinate services, share information, and ensure continuous case management during the transition to the community.

In the Baltimore case, the REP program was managed by an independent non-profit agency – first The Enterprise Foundation, and later Catholic Charities. Thus, the program was a coordinated, community-wide partnership. In a quasi-random experimental design where program participants were matched with non-participants, Roman et al. (2007) found a small reduction in the number of re-arrests – although the estimated crime reduction from program participation also tended to be for the most severe crimes. It is particularly difficult to evaluate these programs because oftentimes the services that are provided to offenders out of prison are available in the community regardless. Hence, the added value is in the improved coordination of services and presumably increased offender participation rates in the right programs targeted to their needs. While the evidence to date is not overwhelming, these programs are not very expensive, and the evidence to date suggests they are well worth the cost. Of course, they must be coupled with the actual services.

Thus, our proposed solution involves both well-designed treatment programs in-prison and out of prison, as well as a coordinated approach to identify appropriate service needs and to offer a supportive re-entry program once the offender is released. While we do not suggest that these ideas are necessarily "new" in Latin American, and indeed there are many reintegration programs, we are unaware of any systematic review of the effectiveness of these programs and are certain that much can be learned from the best practices we have identified in this paper. Thus, we suggest as a starting point such a review of existing programs with an eye towards adding – or replacing them – with the solutions identified here.

SOLUTION 4: Domestic Violence Prevention and Control

While it is one thing to identify domestic violence as an important problem, finding solutions is another matter. Among the factors most closely linked (through correlations – not necessarily a causal connection) to domestic violence are poverty, unemployment and the lack of a social support network (Gonzales de Olart and Llosa, 1999: 45). Cultural factors are also key. As a study by UNICEF (2000: 13-14) noted:

> Domestic violence is a complex problem and there is no one strategy that will work in all situations. To begin with, violence may take place within very different social contexts, and the degree to which it is sanctioned by a community will naturally influence the kind of strategy needed.

> Considering the interconnections between the factors responsible for domestic violence – gender dynamics of power, culture and economics – strategies and interventions should be designed within a comprehensive and integrated approach. A multi-layered strategy that address the structural causes of violence against women while providing immediate services to victim-survivors ensures sustainability and is the only strategy that has the potential to eliminate this scourge….

> Key areas for intervention include:

> - advocacy and awareness raising
> - education for building a culture of nonviolence
> - training
> - resource development
> - direct service provision to victim-survivors and perpetrators
> - networking and community mobilization
> - direct intervention to help victim-survivors rebuild their lives
> - legal reform
> - data collection and analysis
> - early identification of 'at risk' families, communities, groups, and individuals.

According to Sherman et al. (1997), two programs have been shown to "work" in reducing domestic violence. First, they found that the same program we identified in Solution 1 – programs targeting at-risk mothers beginning prenatal through age 2 – were beneficial in reducing child abuse and neglect. Second, they note that a program to train police officers to arrest domestic violence offenders has been shown to be effective in reducing both domestic violence incidents by the perpetrator in the future, but also in the neighborhood where the offender lived. However, the evidence on this second program is of some concern, as the programs were found only to be effective with perpetrators who were employed and in neighborhoods where most households had an employed adult. The reasons why these findings hold – and whether they would hold in another culture outside the U.S. – are not known. In addition, Sherman et al. noted that one "promising" program was a battered women's shelter, which had been found to reduce repeat victimization – at least in the short term (6 weeks).

While the UNICEF report calls for many other pieces of the puzzle – including programs to raise awareness, education and training, and legal reforms, we are unaware of any systematic studies of the effectiveness of such programs. Larraín (1999) reviews existing programs across Latin America – including victim hot lines, battered shelters, special police units, and education programs. While many of these programs seemed to have been beneficial – we are unaware of any attempts to systematically document their effectiveness or to assess costs and benefits. Nonetheless, it does make sense to work on these issues as part of a comprehensive solution that will have a long-term impact. While we have proposed some solutions – these might be duplicative of efforts already underway in some areas. Thus, it would be useful to conduct a more systematic review of existing programs in Latin America and to focus attention where effective programs are not yet in place. It would also seem worthwhile to study the effect of domestic violence and child abuse programs on youth crime and gang membership.

III. COST-BENFIT ANALYSIS

A. Valuing Benefits of Crime Reduction Programs

Programs that are designed to reduce crime may do so in two basic ways: (1) by changing the situational conditions under which crime occurs – such as increased lighting in a parking lot, installing security fences, or removing a child from a home where they have been abused, or (2) by affecting the behavior of potential offenders – such as drug treatment, programs designed to rehabilitate juvenile offenders, or increasing penalties in order to deter potential offenders from committing crimes. Similarly, we can measure the benefits of these programs either based on the reduced number of incidents occurring in these specific situations, or we can measure the number of offenses that have been deterred. In the first case, we are not targeting individual offenders and we might instead measure the number of generic crimes that have been averted. In the second case, however, we are directly affecting individuals and instead of counting generic crimes we are interested in crimes that those particular individuals would have otherwise committed. This suggests that there are two approaches that one could use to measure the benefits of crime control policies. In the first approach, we measure crimes. In the second approach, we measure criminal careers.

We briefly review the literature on the "cost of crime" to illustrate the magnitude of the problem. We turn first to the measurement of the cost of individual crimes:

The Costs of Crime/Benefits of Crime Reduction

The benefits of crime reduction are difficult to quantify – and even the most inclusive estimates inevitably leave out significant cost components. The most comprehensive estimates of the cost of crime (and hence benefits of crime reduction) have been made in the U.S. (Miller, Cohen and Wiersema, 1996; Cohen et al., 2004) and the U.K. (Dubourg, Hamed and Thorns, 2005). Briefly, the costs of crime include (see Cohen, 2005):

1. Victimization costs (including out-of-pocket losses, pain, suffering and lost quality of life from victimization). This could be direct costs to victims but also to their families who might suffer both economically and psychologically.
2. Precautionary expenditures by individuals and business
3. Avoidance behaviors by individuals
4. Criminal justice system
5. Government prevention and rehabilitation programs
6. Residual effects on individuals (e.g. fear)
7. Residual effects on community (e.g. loss of tax base)
8. Overdeterrence (e.g. activities not undertaken by innocent people for fear of being accused of criminal activity).[6]
9. "Justice" costs (e.g. costs incurred solely to ensure that 'justice' is done)
10. Burden imposed on incarcerated offenders and their families

Building up these cost estimates requires a tremendous amount of data, assumptions, and varied methodologies. At best, the various estimates are "ballpark" and under-estimate the true social costs of crime as various components are inevitably left out due to lack of data or appropriate methodologies. However, the "state-of-the-art" in estimating the costs of crime has developed to the point where it is being used by policy makers. For example, in the U.S., the National Institute of Justice requires virtually all program evaluations to include a cost-benefit analysis in their final report. The legislature in the State of Washington has required a systematic review of all existing government programs designed to prevent or control crime – with the understanding that programs not found to be cost-beneficial will be replaced by those where benefits are estimated to exceed costs. In the U.K., the Home Office engages in an ongoing research program to estimate the costs of crime. In fact, there is beginning to be some consistency across estimates, and this growing body of literature has developed to the point where the European Commission has recently funded a two-year study to identify best practices and promote a common methodology for estimating the cost of crime.[7] Thus, "cost of crime" estimates have developed to the point where policy analysts are beginning to feel comfortable using them to compare the effectiveness of programs and to conduct benefit-cost analysis.

One of the more difficult costs of crime to estimate is the loss to communities when there is a significant crime problem. Most of the effort to date has gone into estimating the cost of victimization, the criminal justice system, and to some extent precautionary expenditures (e.g. burglar alarms). More difficult and thus often overlooked are costs to the public at large – such as fear of crime and losses to the community. However, some methodologies have taken a 'top down' approach that in theory encompasses all costs by using surveys of the public's willingness-to-pay to reduce crime (Cohen et al., 2004). Many of these non-victim costs are likely to be

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[6] We note that policies of one country – such as tough immigration policies for fear of bringing in foreign criminals – might be an example of how overdeterrence in one country affects the population (and crime) in another country.

[7] The program, entitled, "Mainstreaming Methodology for the Estimation of the Costs of Crime," is being managed by the Centre for Criminal Justice Economics and Policy, University of York. Professor Cohen is a member of the research team on that project.

non-linear – and in fact, they are expected to increase at the margin (not decrease as many other 'costs' are assumed to in economics). For example, if crime is very low and people are unafraid to walk in the park at night, there are likely to be many people in the park and the risk of crime may even be tempered by the fact that many people are walking around and thus deter criminals at very little cost. Yet, if crime is very high, few people will venture out at night and the risk of walking alone in a park is very high. In such a high crime situation, local residents might take very expensive precautionary measures like purchasing burglar alarms, taking taxis at night, and also suffer from residual fear when simply waiting outdoors for a taxi or getting from their car to their home. Thus, the marginal cost of crime might be much higher in high crime areas than in low crime areas. In the context of Latin America, there is evidence that an additional cost of crime (falling into the "community cost" category perhaps) is the fact that victims of crime have little confidence in governmental institutions and that people in high crime areas are more likely to favor a military coup.[8] While it might be difficult to place a dollar value on the loss in confidence of democratic institutions – this is a real burden of a high crime rate in Latin America.

What this discussion suggests is that in thinking about benefit-cost ratios and in policy options, a program that has a very significant impact on crime might have a much higher benefit-cost ratio than one that has a relatively modest impact on crime – even if costs are linear. In addition, it is quite possible that in order to have a significant impact on crime, there will need to be multiple and perhaps integrative programs. For example, a program targeting at-risk youth to prevent them from joining a gang might have a small impact. Similarly, a police crackdown on gang violence might reduce incidents somewhat. However, a coordinated attack on both the kids who are likely to join a gang as well as a crackdown on gang violence will likely result in better results than the sum of the two programs. This has been shown (as discussed above) in gang violence. However, there are other examples where this might be true. Returning to the earlier example of the impact of violence on the confidence in democratic institutions, programs that have small effects are unlikely to have an impact on the level of confidence even though they have an impact on the cost to individual victims. Only when there are multiple and large scale programs might the additional benefit of public confidence begin to kick in.

The Costs of a Criminal Career

If an individual embarks on a criminal career, he is likely to engage in a variety of crimes over a period of years and also runs the risk of being arrested, convicted and incarcerated. Based on the model described in Cohen (1998), the external costs imposed by a typical criminal career are:

$$\text{Lifetime Cost} = \Sigma_{ij}\ (1\text{-}\beta)^{j\text{-}1}\ \lambda_{ij}\ [(VC_i\ +\ CJ_i\ +\ CI*T_i\ +\ W*T_i] \qquad (1)$$

where λ = mean number of offenses
 VC = victim cost of crime
 CJ = cost of criminal justice investigation, arrest, adjudication
 CI = cost of incarceration (in days)

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[8] See USAID (2006), p. 9. The victim survey results are from LAPOP (various years). The findings about public attitude towards military coups are contained in UNDP (2004).

T = average time served (in days)
β = discount rate
W = opportunity cost of offender's time
 i = crime 1 through crime I
 j = year 1 through year J of crime career

Inside the square brackets are four terms: VC_i (average cost to victims for each type of crime); CJ_i (average criminal justice cost per crime); $CI*T_i$ (average cost of incarceration per crime); and $W*T_i$ (opportunity cost of incarceration as measured by a convicted offender's legitimate wages). Each of these terms is multiplied by λ_{ij}, the number of offenses committed by a career criminal each year. The resulting annual cost can be converted into a lifetime cost by adding average annual costs, discounted to present value by the social discount rate β.

Cohen (1988) estimated the present value of external costs imposed by a typical career criminal to be $1.3 million to $1.5 million in 1997 dollars. However, the worst offenders impose costs as high as $36 million. This excludes any cost associated with drug abuse (which could amount to an additional $150,000 to $364,000 if the career criminal is also a heavy drug user).

To date, there have only been a few attempts to estimate the costs of crime in Latin America. A series of studies funded by the IADB in 1999 estimated the cost of violence in Colombia, México, Perú, Brasil, Venezuela and El Salvador, to range between 0.3% and 5.0% of GDP. These papers used similar methodologies to that used in the U.S. and U.K. While a first step in the process, those earlier papers had many shortcomings. More recently, the United Nations Development Program (UNDP) financed a study "*Cuanto Cuesta la Violencia a El Salvador*" ("How Much Does Violence Cost El Salvador?"), in which the costs of violence were estimated to be approximately 11.5 percent of the GDP.

While direct comparisons are difficult, it is interesting to compare the estimates in Latin America to those in the U.S. and U.K. Adding the costs of criminal victimization in Cohen, Miller and Wiersema (1996) to the costs of the criminal justice system in the U.S., yields an estimate of over $600 billion – about 5% of GDP. Similarly, the Home Office estimates place the cost of crime in the U.K. at about $60 billion - 2.6% of GDP.

B. Cost-Benefit Analysis of Proposed Solutions

To date, there have only been a handful of cost-benefit studies in the criminal justice arena. For example, McDougall et al. (2003) conducted a systematic review of cost-benefit studies in the area of sentencing - including both custodial and non-custodial sentencing options such as incarceration, intensive supervision, day reporting centers, home confinement, shock incarceration programs, electronic monitoring, community service, fines, and treatment programs or other interventions that were part of a sentencing option. Yet, only six studies where a valid cost-benefit conclusion could be drawn were identified. These six studies involved (a) pre-trial diversion into a drug treatment program for drug offenders, (b) in-prison treatment for sex offenders (two studies), (c) intensive supervision as an alternative to incarceration, (d) longer prison sentences for adults convicted of felonies, and (e)

family and juvenile offender treatment programs. Only two of these studies included the intangible costs of crime.

The most common approach to valuing the nonmonetary cost of victimization in the U.S. has been to rely upon the estimates in a National Institute of Justice Report by Miller et al. (1996). These estimates are based on jury awards for pain and suffering in the U.S. However, a study by Cohen and Miller (2001) reviewed these and other jury awards and compared them to estimates of the statistical value of a life. They found that the implied value of a statistical life using the jury award methodology to value crime victimization is approximately $3.8 million in 1995 – very close to the estimated value of a statistical life in the U.S. that economists have derived from numerous market-based studies. In an Appendix, we convert this figure into an estimate of the value of a life year, and a DALY, and also provide a methodology for converting U.S. costs into the Latin American context for purposes of this study.

SOLUTION 1: Comprehensive programs targeting at-risk mothers and young children under age 5.

Aos et al. (2004) estimate the cost of a home visitation program where nurses work directly with pregnant women and young children to be $9,188 in 2003 dollars. They estimate benefits to be $26,298, or 2.88 times the costs. Benefits included in this analysis are reduced child abuse and neglect to the children as well as reduced juvenile and criminal offending behavior of these children, and increased high school graduation rates. Note that the educational benefits account for about 12.6% of this total ($3,325 out of $26,298), with the remaining value being reductions in child abuse and neglect ($5,686, or 21.6%), drug or alcohol abuse ($850 or 3.2%) and criminal offending behavior ($16,437, or 62.5%).

In addition, we propose a comprehensive pre-kindergarten program for low income 3 and 4 year old children. Aos et al. (2006) estimate the cost of this program to be $7,301 per child in 2003 dollars, with benefits being $17,202, for a benefit-cost ratio of 2.36 to 1. Benefits include reduced child abuse and neglect, improved educational outcomes, and reduced crime later in life.

Combining these programs would cost a total of $16,419 per child (over a four year period), with benefits of $43,500 – for a benefit-cost ratio of 2.65 to 1. This benefit-cost ratio is a based on a 3% discount rate. However, because the benefits of these programs accrue many years beyond the treatment (Aos et al. carry benefits out through age 33), using a 6% discount rate would lower the benefits of the early childhood education programs approximately 50%.[9] Similar reductions would need to be made for the home visitation program by nurses. Thus, using a 6% discount rate,

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[9] Personal communication with S. Aos, March 31, 2007. Note that throughout this Solutions Paper, we have reduced the benefit-cost ratio by 50% in the case of early childhood programs and 25% in the case of programs targeting youth and adult offenders. While Aos and his colleagues have appropriately discounted both costs and benefits, we do not have the year-by-year costs or benefits from which we could report the revised dollar figures using a 6% discount rate. Thus, we only report on the revised benefit-cost ratios when using a 6% discount rate.

we estimate total benefits of approximately $21,750 compared to costs of $16,419 –
for a benefit cost ratio of 1.32 to 1.

Solution 1 – Early Childhood Programs
Benefits and Costs (based on U.S. Dollars)

	Costs	Benefits	B-C Ratio (3%)	B-C Ratio (6%)
Nurse Family Partnership	$9,188	$26,298	2.86	1.43
Early Childhood	$7,301	$17,202	2.36	1.18
Combined	**$16,489**	**$43,500**	**2.64**	**1.32**

While it is not easy to translate these cost-benefit ratios to the Latin American
context, a few adjustments can be made to account for differences in the valuations
used in the Aos et al. studies and the "standardized" DALY value that are to be used
in this paper. The methodology used to do this is explained in an Appendix. Note that
reduced DALYs account for only about 30% of the cost of criminal victimization,
with the remaining 70% being the cost of lost wages, medical costs, criminal justice
costs, etc. The result is the following table that lists the benefits and costs under
varying assumptions about discount rates and DALYs.

Solution 1 – Early Childhood Programs
Benefits and Costs (based on adjustments for this paper)

	Discount Rate = 3%			Discount Rate = 6%
DALY	Benefits	Costs	B-C Ratio	B-C Ratio
Low ($1,000)	$5,700	$2,650	2.2	1.1
High ($5,000)	$6,100	$2,650	2.3	1.1

SOLUTION 2: Comprehensive program to deal with youth and gang violence.

As discussed, our proposed solution is a two-pronged approach including a
comprehensive program cracking down on gang violence, coupled with a
rehabilitative program for juvenile offenders. While we have identified several cost-
benefit studies for the juvenile offender programs, we are unaware of any cost-benefit
studies of the gang violence aspects of our proposed solution. For example, the
authors of the most comprehensive study of the successful program in Boston claim,
"…Operation Ceasefire did not impose additional costs on the participating
organizations, but was implemented by using existing resources more strategically."
In Boston, state, local and federal enforcement officials coordinated and focused their
attention on gang violence, guns, etc. However, in addition to cracking down on
gangs, they also coordinated with local juvenile justice and service agencies, as well
as local clergy and community groups. Unfortunately, most Latin American cities are
unlikely to have the same level of existing police and community resources in place.
Thus, additional resources might be required. Depending upon existing capacity in a
city, this might be a relatively small investment – perhaps one or two dedicated police
officers and case managers. Less certain, however, is the existence of community-
level organizations such as clergy or community volunteers who are willing and able

to devote their energy to such a project. While we have not included the cost of these additional resources, as discussed below, the benefit-cost ratio of the juvenile offender rehabilitation program is so high that we are confident of a significant positive benefit-cost ratio on balance.

For the juvenile rehabilitation programs, we assume that each of the three programs will be needed in equal amounts. This is an arbitrary assumption, but each city will require different combinations of these programs depending upon the mix of juvenile offenders. Moreover, as shown, all three have relatively high benefit-cost ratios and regardless of the weights, they will more than pay for themselves. Aos et al. (2004) estimate the cost of a "functional family therapy" program for juvenile offenders to be $2,140. They estimate benefits to be $28,356, or 13.25 times the costs. The Adolescent Diversion Project is estimated to cost $1,777 per participant, and result in benefits of $24,067, or 13.54 times the costs. The Aggression Replacement Training program is estimated to cost $759 per participant, with benefits of $15,606 – 20.59 times the costs. In all three cases, the only benefits included in the analysis are reduced juvenile delinquency. Not included, but also potential benefits, are reduced substance abuse and the value of increased long-term wage productivity to the extent these juvenile offenders stay in school and ultimately have more successful working lives than they would without treatment. Assuming an equal percentage of each program, the average cost per participant is estimated to be $1,559, with average benefits being $22,676 – for a benefit-cost ratio of 14.54.

Once again, the Aos et al. (2006) estimates are based on a 3% discount rate. Unlike early child education programs, the benefits of these programs begin to accrue immediately. However, discounting is also a factor, as Aos et al. estimate criminal activities through age 33. Thus, using a 6% discount rate, we have estimated a reduction of 25% from the benefits that accrue using a 3% discount rate. Thus, benefits are estimated to be $17,007 compared to costs of $1,559, a benefit cost ratio of 10.91 to 1.

Solution 2 – Youth Violence
Benefits and Costs (based on U.S. Dollars)

	Costs	Benefits	B-C Ratio (3%)	B-C Ratio (6%)
Functional Family Therapy	$2,140	$28,356	13.25	9.94
Adolescent Diversion	$1,777	$24,067	13.54	10.16
Aggression Replacement Training	$ 758	$15,606	20.59	15.44
Average	**$1,558**	**$22,676**	**14.54**	**10.91**

To translate these figures into the Latin American context and to be consistent with the papers in this project, we use the same methodology as used in Solution 1 to transform intangible crime control benefits into DALYs and convert wage rates from the U.S. to Latin American levels. In this case, all benefits that have been estimated are crime reductions, hence the DALY adjustment is made to 30% of benefits, with the wage adjustment being made to the remaining 70%. Doing this provides the following benefit and cost figures:

Solution 2 – Youth Violence
Benefits and Costs (based on adjustments for this paper)

| DALY | Discount Rate = 3% | | | Discount Rate = 6% |
	Benefits	Costs	B-C Ratio	B-C Ratio
Low ($1,000)	$2,600	$ 250	10.4	7.8
High ($5,000)	$2,900	$ 250	11.5	8.7

We also note that we have not included programs specifically targeting education – such as "stay in school" education programs and incentives to graduate high school. While many of these programs appear to have significant crime-related benefits – often high enough to justify the programs solely on the basis of crime reductions – these are programs that are more appropriately reviewed in a paper on education. However, it would be important that the authors of that paper take into account the likely crime reduction benefits as well.

SOLUTION 3: Comprehensive Prison Treatment and Reintegration Program.

Offenders who are released from prison have extremely high recidivism rates. Thus, if a program targets these offenders while in prison, it might have a high payoff if successful in reducing recidivism. Three such programs – if implemented correctly – have been shown to reduce recidivism: (a) drug treatment, (b) educational and vocational programs, and (c) cognitive behavioral therapy. While these programs have been found to be effective, additional benefits may accrue when similar (and additional) programs extend to offenders upon their release from prison. – to assist in their reintegration into society.

Drug treatment programs have been found to be cost-beneficial both in prison and in the community. Community drug treatment is often an alternative to prison, so that it is much less expensive, but has generally been found to be cost-effective only for drug offenders – not those who are also property crime offenders (see Aos, 2005). Aos et al. (2006) estimated the cost of drug treatment in prison to be $1,604, compared to drug treatment in the community of $574. Benefits were similar, totaling $10,628 in the community (benefit-cost ratio = 18.5) and $9,439 in prison (benefit-cost ratio = 5.88). Cognitive behavioral therapy – either in prison or in the community – has been estimated to cost $105 per offender, with a benefit of $10,404 – nearly 100 times the cost. In all cases, these benefits only include the value to taxpayers through lower criminal justice costs as well as savings to crime victims – they do not include any benefits to the offender or society through increased labor productivity or reduced drug use itself.

Aos et al. (2006) also estimate that educational programs in prison cost $962 per offender on average, compared to benefits of $11,631 – for a benefit-cost ratio of 12.09. Vocational education programs in prison are estimated to cost $1,182 per participant, with benefits of $14,920 – for a benefit-cost ratio of 12.62. Similarly, employment and job training programs for recently released offenders have been estimated to cost $400 per offender, with total benefits of $4,759 – a benefit cost ratio of 11.89. In all cases, these benefits are restricted to criminal justice and criminal

victimization outcomes – not the increased labor productivity associated with improved employment outcomes. Thus, benefits are expected to be considerably higher.

Roman et al. (2007) estimate the cost of the Maryland re-entry program to be $1.2 million annually, with 176 offenders being treated. This cost of $6,900 per offender includes the cost of the treatment programs themselves – including transitional housing - but we do not have information on the details of the programs received. Benefits were estimated to be $31,824, although these findings were not statistically significant by standard measures (p<.15). The benefit-cost ratio for this program is thus 4.6 to 1. Note that this finding is based on a five-year follow-up to post-release. Presumably, benefits stretch beyond that point. The measured benefits include reduced cost to the criminal justice system and to victims. They do not include any potential benefit to the offender and society through improved labor outcomes or reduced drug abuse.

Roman and Chalfin (2007) also conduct a hypothetical benefit-cost study of re-entry programs for jailed inmates – often used as a pretrial diversion. Comparing actual costs of two programs to potential benefits, they find that the "break-even" effectiveness rate is approximately 5% reduced recidivism or less. In other words, to pay for themselves, these programs would need to reduce recidivism by 5% more than the rate non-treated offenders would be expected to recidivate. Roman and Chalfin (2007) also provide detailed cost estimates for two programs – ranging from $489 to $672 per offender, with a "high end" program costing $3,000. These programs provide differing services ranging from education and employment assistance, health care, transportation assistance, and case managers that help coordinate and find local community services for released offenders.

In assessing the benefits and costs of our comprehensive program for treatment and re-integration of offenders, we have used the lower cost estimate of the jail re-entry program (as opposed to the prison re-entry program since that includes many services that would likely be double-counted with our treatment programs). Thus, we estimate costs of $672 per offender. We do not include any benefits for this portion of our program – since the benefits of the actual treatments are high enough, and the benefits of the actual re-entry services are not fully documented. In other words, we have been careful to be conservative in estimating benefits – they are clearly higher than estimated here. Moreover, to achieve the most benefit from these treatment programs, we believe it is important to employ some form of coordinated re-entry program.

Combining these programs, we assume educational programs, employment programs, and cognitive behavioral treatment programs are needed for all offenders, while drug treatment is required for 50% of offenders. Assuming an equal portion of drug treatment will be done in prison and in the community, the total costs per adult offender are thus estimated to be $2,794 ($105 for cognitive behavioral therapy, $1,072 average for educational programs, $400 for employment programs, and $672 for re-entry assistance; plus 50% x $1,089 average for drug treatment).

While we have provided benefits estimates for each program, it is not necessarily true that we can simply add them all up. While we are certain that

providing both drug treatment and educational programs to offenders will offer higher benefits than simply providing one or the other, we do not know if the combined benefits will be less than or more than the sum of the two. It is quite possible that there are synergistic effects and the combined effect is more than the sum of the parts. However, to be conservative, we assume a diminishing marginal benefit from adding each program. At one extreme, we could assume the highest level of benefits for one program and no benefits for each additional program. If we took this approach, benefits would be $13,275 based on the average benefit for educational and vocational programs in prison. With total costs of $2,794 per offender, the benefit-cost ratio would be 4.75. Alternatively, if we adopted the assumption used in Aos et al. (2006), and reduced each additional program by 25%, benefits would be $28,603 [($13,275 + 75% x 10,404 + 75% x ($10,628 + $9,439)/2)]. This would yield a benefit cost ratio of 10.2.

Once again, the above figures are based on a 3% discount rate. If we assume a 6% discount rate, benefits would be reduced by approximately 25%, so that the benefit cost ratio would range between 3.6 and 7.7.

Solution 3 – Prison Treatment and Reintegration Program

Program	Costs	Benefits	B-C Ratio (3% Discount)	B-C Ratio (6% Discount)
Drug treatment in prison	$1,604	$9,439	5.9	4.4
Drug treatment in community	$574	$10,628	18.5	13.9
Cognitive behavioral therapy	$105	$10,404	99.1	74.3
Educational programs in prison	$962	$11,631	12.1	9.1
Vocational programs in prison	$1,182	$14,920	12.6	9.5
Job training programs upon release	$400	$4,759	11.9	8.9
Re-entry coordination program	$672	0		
Average *	$2,794	$13,275 - 28,603**	4.8 - 10.3	3.6 - 7.7

* See text: Assumes 50% drug treatment (equal shares in and out of prison); 100% educational or vocational programs in prison; 100% job training upon release.
** Lower figure based only on average benefits from educational/vocational programs. Higher figures adds to this 75% of additional program benefits.

To convert these estimates into the appropriate figures for this project, we once again convert 30% of crime benefits into DALY estimates and the remaining costs and benefits using the differential in U.S. versus Latin American wage rates. It is important to keep in mind that all of these estimates are conservative as they exclude the benefits from improved labor productivity that are likely to accrue from these programs and instead only focus on crime control benefits.

Solution 3 – Prison Treatment and Reintegration
Benefits and Costs (based on adjustments for this paper)

	Discount Rate = 3%			Discount Rate = 6%
DALY	Benefits	Costs	B-C Ratio	B-C Ratio
Low ($1,000)	$1,545-$3,329	$ 450	3.4 – 3.8	2.6 – 2.8
High ($5,000)	$1,705-$3,673	$ 450	7.4 – 8.1	5.5 – 6.1

SOLUTION 4: Domestic Violence Prevention and Control

The evidence on the benefits and costs of domestic violence programs is sparse. Unfortunately, we were unable to find studies that examine the comprehensive approach recommended by UNICEF. We were also unable to find studies that estimate the costs and benefits of domestic violence interventions by police or battered women's shelters.

The only benefit-cost analysis we are aware of involving domestic violence programs is the new mother/early childhood program targeting at-risk families for children under age 2, which was discussed in detail under Solution 1. Aos et al. (2004) estimate that about 21.6% ($5,686 out of $26,298) of the benefits of that program are due to reduced child abuse and neglect – with the remaining benefits being apportioned to improved educational outcomes (12.6 % - $3325/$26,298), and reduced crime by the children once they become older (62.5% - $16,437/26,298), and alcohol and drug abuse (3.2% - $850/26268).

Summary Tables of Costs and Benefits and Concluding Remarks

Before presenting our summary tables on the costs and benefits of our proposed solutions, we want to emphasize another recommendation coming our of our review of the evidence. Before recommending "changes" and "new programs" it is important to inventory and assess existing programs in Latin America. There is a glaring need to obtain better information on what existing programs are being used – and which have promise based on external studies (such as the ones we identified in this paper) or through localized studies.

The following table contains summaries of the estimated benefits and costs of the solutions proposed in this paper. We note that these estimates are meant more to be "illustrative" than definitive – as they are based on extrapolations from the U.S. experience. While there is evidence that the proposed programs can work and provide benefits that far exceed costs, translating them from the U.S. experience to the Latin American experience would require pilot testing, tailoring of programs to suit local needs, etc. As noted above, there might be existing programs in some locations that are similar to those that are known to work from the U.S. experience. These should be followed closely to determine if they are appropriately designed or could benefit from minor modifications. Regardless, they are likely to have already been adapted to local circumstances and much can be learned from their experiences. In addition, the cost and benefit estimates themselves are largely based on U.S. wage rates, the value of intangible harms from crime, etc. These have been conservatively converted into

Latin American values – but once again they are meant to be more illustrative of the type of benefits one can achieve with these programs.

It is also important to note that the benefit-cost ratios shown here are based on very conservative assumptions as indicated in the "notes" section of the table. In some cases, even though improved educational outcomes and hence long-term productivity gains are to be expected, they were not included in our estimates due to data limitations. Moreover, benefits are generally extended out no more than 33 years (and 15 years for adult offenders). Especially for early childhood education and domestic violence programs, the benefits might continue beyond that time frame.

Finally, we understand that the most controversial aspect of placing monetary values on crime is the valuation of the intangible losses to crime victims and to communities. While these have been included through the monetization of DALYs as called for in this project, it is important to emphasize that most of the benefits that have been valued are savings from reduced criminal justice and court costs, and the reduced out-of-pocket losses to victims such as property losses, wages, and medical costs. Intangible costs in our estimates generally represent only about 5% of benefits or less. Thus, even ignoring these benefits would not change our basic recommendations.

Summary of Benefit-Cost Ratios for Crime and Violence Solutions

Solution	Discount Rate 3%		Discount Rate 6%		Notes
	DALY $1,000	DALY $5,000	DALY $1,000	DALY $5,000	
1. Early Childhood	2.2	2.3	1.1	1.1	
2. Youth Violence	10.4	11.5	7.8	8.7	Excludes benefits of drug abuse & education; excludes cost of gang violence coordinator
3. Prison Treatment & Reintegration	3.4 – 3.8	7.4 – 8.1	2.6 – 2.8	5.5 – 6.1	Excludes benefits of drug abuse & education
4. Domestic Violence	?	?	?	?	Solution 1 includes benefits from child abuse reduction.

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Appendix – Conversion of U.S. Wage Rates and Value of Statistical Life Estimates

In this Appendix, we provide details on the assumptions used to convert the costs and benefits from the various studies by Aos and his colleagues in the U.S. to the Latin American context. This requires both converting dollars of tangible losses into an equivalent value in Latin America as well as converting the intangible losses into a DALY equivalent.

The largest cost component of criminal justice, crime prevention and treatment programs is labor. According to the 2006 World Bank Development Indicators (Table 2.6), the average cost of a manufacturing worker in the U.S. was $28,907 during the 1995-1999 time period, the last reported data available. Data for Latin America during the same time period ranged from a low of $1,806 in the Dominican Republic to a high of $14,134 in Brazil. The average for the 15 Latin American countries included in the survey was $4,705.[10] This is 16.2% of the cost of labor in the U.S. Thus, in our final cost-benefit estimates, we multiply all costs and all tangible benefits by 16.2%.

The Guidelines for the solution papers recommends that authors standardize the valuation of DALYs at a range of $1,000 and $5,000. However, the intangible crime benefits valued by Aos and his colleagues are based on the intangible costs of crime estimated by Miller, Cohen and Wiersema (1996). While the latter are oftentimes used in benefit-cost analyses and by policy analysts, we do not need to adopt those figures here. Instead, we have used the information from Miller, Cohen and Wiersema and related studies to infer a DALY loss from crime that can then be valued based on the standard $1,000 to $5,000 range.

Cohen and Miller (2003) used the same source of data on jury awards to crime victims that was used by Miller, Cohen and Wiersema (1996), to estimate the implied statistical value of a life from jury awards. They found that jury awards, on average, valued a statistical life by $3.8 million 1995 dollars. Reducing this to account for tangible wage losses, this implies a value of the intangible losses to be $2.8 million. Based on an approximate 50 year remaining life span for the typical crime victim, this implies a value of the intangible portion of a statistical life year of approximately $100,000.[11] This is between 20 and 100 times larger than the DALY estimate recommended here. Thus, we have adjusted the intangible benefit downwards to

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[10] Countries included were: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Panama, Paraguay, Uruguay, and Venezuela.

[11] We note that this $100,000 figure is considerably less than the current estimate of the statistical value of a life year of $300,000 as suggested by Viscusi (see e.g. Aldy and Viscusi, 2007). However, we use the $100,000 figure because that was derived directly from the source of the data that was used to value crime victimization. We also note that the "value of a statistical life year" is not the same as the value of a DALY. However, these figures should generally be close and there is no other way to estimate a comparable figure based on the guidelines for this project. Ultimately, the DALY calculations account for a very small portion of benefits.

account for this difference. To do this, we multiple intangible crime victim benefits by either 0.05 or 0.01.

To illustrate how we have adjusted the estimates, consider the home visitation program recommended as part of Solution 1. According to Cohen (1996), approximately 30% of the costs of crime (including criminal justice and crime victim costs) are due to intangible effects on the quality of life of crime victims. Moreover, of the $43,500 estimated benefits from Solution 1, $28,935 are due to reduced crime with the remaining $14,565 being improved productivity through reductions in drug abuse, alcohol and increased educational attainment. Thus, about 30% of the $28,935 benefit – or $8,680 - is estimated to be the value of improved quality of life to victims. This would translate into approximately .087 of a DALY in the U.S. (based on the valuation of $100,000 per DALY). Using the range of $1,000 to $5,000 per DALY required in this project, this translates into a range of $87 to $435. Of course, the remaining 70% of benefits also need to be valued. Using the 16.2% estimate discussed above, this portion of benefits totals $5,641 ($34,820 x .162). Added to the DALY values, benefits range between $5,723 and $6076.

Of course, costs also need to be adjusted. Thus, the estimated per-participant cost in the U.S. of this program has also been multiplied by 16.2% - resulting in a cost estimate of $2,650 ($16,419 x .162). Ultimately, this leaves a benefit cost ratio ranging from 2.2 to 2.3.