

BORDER METRICS: HOW TO EFFECTIVELY MEASURE BORDER SECURITY AND IMMIGRATION CONTROL



By Marc R. Rosenblum and Faye Hipsman

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Executive Summary

Despite the expenditure of more than \$250 billion on immigration enforcement and border security over the past three decades, including huge increases in the size of the Border Patrol, the addition of hundreds of miles of fencing, and the advent of technologies such as ground sensors and unmanned aerial vehicles to detect illegal entries, deep divisions persist about the state of border security at the U.S.-Mexico border.

The absence of timely, reliable, and widely accepted indicators of border security and immigration control represents a fundamental obstacle to resolving this debate. Without such metrics, basic questions about immigration flows, the success of particular enforcement policies and programs, and benefits of potential future investments cannot be authoritatively answered. As a result, Congress and the American public often doubt progress that the Department of Homeland Security (DHS) has made in strengthening border security, and insist that broader reforms to the immigration system must await proof of success at the border.

The absence of timely, reliable, and widely accepted indicators of border security and immigration control represents a fundamental obstacle to resolving this debate.

The development of reliable metrics of border security and immigration control is methodologically complex and politically risky—factors that have blocked previous efforts by DHS and others to produce comprehensive indicators. Indeed, DHS was forced to shelve plans for a Border Conditions Index in 2013 after two years of research on the subject; and a new report released in January 2016 made clear the limitations and complications inherent in measuring visa overstays. Nonetheless, while illegal immigration cannot be measured with absolute precision, a number of reliable approaches exist to estimate unauthorized flows and the unauthorized population. Ultimately, analysts must answer four questions:

- 1) How many unauthorized immigrants enter between ports of entry?**
- 2) How many unauthorized immigrants enter through ports of entry?**
- 3) How many temporary immigrants overstay their visas and thereby become unauthorized?**
- 4) How many unauthorized immigrants reside in the United States?**

Accurate answers to these four questions would provide a comprehensive accounting of illegal immigration flows and the stock of unauthorized immigrants living in the country.

This report provides a general overview of the available methods for answering each of these questions, the limitations of existing methodologies, and potential strategies for improving measures. It concludes by describing immediate steps Congress and DHS should take to support better migration metrics.

Estimating unlawful entries between ports of entry (POEs)—the most politically charged border issue—is difficult because there will always be uncertainty about successful illegal entries. DHS currently uses Border Patrol apprehensions as a proxy measure of illegal inflows, but apprehensions fail to account for individuals who evade detection or arrest. Three additional methodologies may be used to estimate illegal inflows between POEs. The first, model-based recidivism analysis, produces an estimate by comparing the total number of apprehensions to the number of individuals who are later reapprehended (i.e.,



recidivists). The second methodology uses data points from migrant survey research to estimate inflows. The third methodology uses observational measures, or a variety of metrics collected during Border Patrol surveillance (for example, migrants who are believed to have evaded capture and crossed successfully). None of these methodologies offers a complete strategy for estimating inflows, but each relies on different types of primary data, meaning DHS can and should pursue an all-of-the-above approach. Taken together, these three methods can produce a reliable range of estimates.

Estimating unlawful entries at ports of entry requires a different kind of methodology because ports are primarily responsible for facilitating high volumes of lawful travel and trade. Migrants may cross unlawfully through POEs by using fraudulent documents or by hiding in vehicles or cargo. U.S. Customs and Border Protection (CBP) already estimates illegal flows through the ports under its Random Compliance Examination (COMPEX) program, which selects a random sample of cleared travelers and subjects them to a more rigorous inspection. CBP calculates the percentage of admitted travelers that COMPEX finds to be unauthorized, along with overall admissions numbers, to estimate illegal POE inflows. This approach is methodologically straightforward, but there are crucial gaps in COMPEX coverage and important questions about sample size. The key issues here are to commit sufficient resources to ensure that the program covers a representative sample of travelers and to provide more public information about the program and its results.

Between one-third and half of all unauthorized immigrants enter lawfully but fail to depart when their temporary visas expire, so enumerating overstayers is also an essential measurement challenge. To count overstayers directly, records of nonimmigrant arrivals must be compared to nonimmigrant departures—the difference between the two figures being the number of overstays. DHS in January 2016 issued the first official estimates of visa overstay rates since 1997, matching data on arrivals and departures at air and sea ports, but its departure data are incomplete when it comes to people leaving through land ports, particularly at the Southwest border. And even where departure data exist, collected by carriers at air and sea ports and by the government of Canada on the Northern border, DHS is still working to fully reconcile arrival and departure records while controlling for nonimmigrants who lawfully extend their stays. DHS plans pilot programs to collect additional air and sea exit data in 2016, and to expand its data-matching systems to more fully account for individuals who lawfully extend their stays in the United States. Collecting Southwest border exit data is more difficult, but the department currently collects data on a limited number of travelers, and should work to expand data collection, initially by ensuring that existing collection methods cover a representative sample of travelers, and perhaps eventually through an information-sharing agreement with the government of Mexico, similar to one now operating with Canada.

DHS is still working to fully reconcile arrival and departure records while controlling for nonimmigrants who lawfully extend their stays.

Finally, the size of unauthorized population living in the United States (i.e., the “stock” of unauthorized immigrants) is the most important measure of border security and immigration control because it encompasses all three flow measures as well as the effects of interior enforcement (e.g. deportations) and other factors that cause unauthorized immigrants to return home. No definitive data source on the unauthorized population exists because unauthorized immigrants are reluctant to be identified and counted. Thus, DHS and nongovernmental analysts employ the so-called “residual method.” This approach uses U.S. Census and DHS data to calculate the total noncitizen population and the number of legal noncitizens in the United States, and then subtracts legal noncitizens from total noncitizens. The difference (or “residual”) is the estimated unauthorized population. These estimates are considered to be reliable, but better and more frequent surveys of the noncitizen population and more information from DHS about legal noncitizens could make them timelier and more precise.



There are a number of immediate steps Congress and DHS should take to support better metrics to measure border enforcement and other immigration controls. In general, the goal should be to produce up-to-date and reliable metrics of all four indicators identified above: illegal flows between and through ports of entry, visa overstays for all visa types and through all ports of entry (including land ports), and the size of the unauthorized population. The future of reliable border metrics depends on DHS producing and releasing border-related data in a far more transparent, timely, and predictable manner—only then can it build credibility and win the trust and confidence of Congress and the American people.

I. Introduction

The United States has spent more than \$250 billion on border security and immigration enforcement since Congress first attempted to address large-scale illegal immigration by passing the 1986 *Immigration Reform and Control Act* (IRCA).¹ The Department of Homeland Security (DHS) describes the U.S.-Mexico border as more secure than ever, and the estimated stock of unauthorized immigrants in the United States has fallen in recent years for the first time in nearly three decades.² But some national politicians, members of Congress, and others continue to describe the Southwest border as out of control, and insist that the United States should consider broader reforms to the U.S. immigration system only after the border has been secured.

The absence of timely, reliable, and publicly trusted indicators of immigration control represents a fundamental challenge to resolving this public debate and definitively establishing the degree of border control. Without such metrics, basic questions about changes in immigration flows and the effectiveness of policies and programs cannot be authoritatively answered, and Congress and the American public can doubt the significant progress that DHS has made in strengthening border security. Members of Congress and other key stakeholders, including the public, also lack benchmarks that could be used to track progress on border security as broader immigration reforms are considered. Moreover, the absence of such metrics makes it difficult for Congress and DHS to evaluate existing policies and programs or make informed choices about the costs and benefits of current and potential investments.

It is not for lack of effort or political attention that such indicators remain unfulfilled. DHS and before it the U.S. Immigration and Naturalization Service (INS), as well as numerous nongovernmental researchers, have proposed a series of different approaches over the years. Certain elements of a measurement system already exist, as described in this report. But many important metrics remain incomplete and others go unpublished, in some cases because they are considered law enforcement sensitive. The absence of a recognized off-the-shelf, publicly available tool for measuring immigration control, and the complexity involved in developing reliable estimates present significant challenges. Resolving these challenges is all the more difficult given the centrality of border security and immigration control to the always contentious immigration policy debate. In short, committing to a measurement strategy is politically risky.

1 Update of estimates included in Doris Meissner, Donald M. Kerwin, Muzaffar Chishti and Claire Bergeron, *Immigration Enforcement in the United States: The Rise of a Formidable Machinery* (Washington, DC: Migration Policy Institute, 2013), www.migrationpolicy.org/research/immigration-enforcement-united-states-rise-formidable-machinery. Spending for fiscal years (FY) 2013-15 includes U.S. Customs and Border Protection (CBP), U.S. Immigration and Customs Enforcement (ICE), and the Office of Biometric Identity Management (OBIM) within the Department of Homeland Security (DHS) National Protection and Programs Directorate. FY 2015 reflects the President's budget request. See DHS, *Budget-in-Brief: Fiscal Year 2015* (Washington, DC: DHS, 2014), www.dhs.gov/sites/default/files/publications/FY15BIB.pdf.

2 The unauthorized population fell from about 3.2 million to 1.9 million between 1986 and 1988 as a result of the legalization programs included in the 1986 *Immigration Reform and Control Act*. The population increased steadily between 1990 and 2007; it has declined by about 1 million people since peaking at 12.2 million in 2007. See Ruth Ellen Wasem, *Unauthorized Aliens Residing in the United States: Estimates Since 1986* (Washington, DC: Congressional Research Service, 2012), www.fas.org/sgp/crs/misc/RL33874.pdf; Jeffrey S. Passel and D'Vera Cohn, "Unauthorized immigrant population stable for half a decade," Pew Research Center Fact Tank, July 22, 2015, www.pewresearch.org/fact-tank/2015/07/22/unauthorized-immigrant-population-stable-for-half-a-decade/.



Nonetheless, while the nature of illegal immigration ensures that it—like any other illicit activity—cannot be measured with absolute precision, a number of proven methodologies can be used to estimate unauthorized flows and to describe changes in the size of the unauthorized population. Taken together, these metrics have the potential to ground the sometimes abstract conversation about immigration policy in reality.

This report begins by identifying four key questions about border security and immigration control; considered together, these questions provide a full accounting of illegal immigration levels and modes of entry. Later sections describe what methods and metrics already exist to answer these questions (including available information about unpublished DHS research), as well as the strengths and limitations of existing approaches, and how they could be improved. The report concludes by describing immediate steps Congress and DHS should take to support a more informed public debate about migration metrics.

II. Four Key Questions about Border Security and Immigration Control

What do Congress, DHS, and the American public need to know about border security and immigration control? Ultimately, there are four key questions that speak to the effectiveness of border enforcement and other immigration controls:

- 1) How many unauthorized immigrants enter between ports of entry?**
- 2) How many unauthorized immigrants enter through ports of entry?**
- 3) How many people overstay temporary, nonimmigrant visas and thereby become unauthorized?**
- 4) How many unauthorized immigrants reside in the United States?**

Accurate answers to these four questions would provide a comprehensive accounting of illegal immigration flows and the stock of unauthorized immigrants now living in the country. The first two questions cover the universe of illegal entries: anyone entering the United States without authorization must either cross a border without inspection or pass unlawfully through an air, land, or sea port of entry (POE). Such illegal entries account for an estimated one-half to two-thirds of unauthorized immigrants.³ The remainder is comprised of people who enter the country lawfully and then overstay or violate the terms of a temporary visa, such as a tourist visa, as discussed in greater detail below. Thus, a complete accounting of unauthorized flows also requires an estimate of these so-called visa overstayers.

Finally, the single most important measure of illegal immigration is the stock of unauthorized immigrants residing in the United States. This figure supersedes the others because it encompasses all three illegal migration streams—between ports, through ports, and overstays—along with the combined effects of immigration enforcement within the interior of the country (i.e., deportations) and other factors that cause some unauthorized immigrants to leave. Changes in the size of the unauthorized population over time offer a comprehensive measure of the overall effectiveness of U.S. immigration enforcement. Ultimately, the size of the unauthorized population is perhaps the most important of these metrics because

³ Pew Hispanic Center, “Modes of Entry for the Unauthorized Migrant Population” (fact sheet, Pew Hispanic Center, Washington, DC, May 22, 2006), www.pewhispanic.org/files/2011/10/19.pdf; Robert Warren and John Robert Warren, “A Review of the Declining Numbers of Visa Overstays in the U.S. from 2000 to 2009,” Center for Migration Studies of New York, 2013, <http://cmsny.org/wp-content/uploads/Warren-Blog-on-Overstays-4.1.13.pdf>.



settled unauthorized immigrants,⁴ more so than people who flow back and forth across the border, are those who participate for better or worse in local economies, pay taxes and use government benefits and services, and interact in various ways with other U.S. residents.

Questions about unauthorized immigrants cannot be answered with complete precision, in part because unauthorized immigrants seek to avoid detection; measures of the unauthorized stock and flows will always be characterized by a degree of uncertainty. Thus, in addition to these direct estimates of illegal immigration, a number of supplementary metrics—the border apprehension rate, the deterrent effect of border enforcement, and smuggling costs—provide additional insight into the state of border security, as discussed below.

III. Current Metrics of Border Security and Immigration Control

Accurate answers to the four questions identified above would provide a complete accounting of illegal immigration flows and stock, as well as the effectiveness of immigration-related border security measures. This section provides a general overview of available methods for answering each of these questions, the limitations of existing methodologies, and potential strategies for improving measurements.

A. How Many Unauthorized Immigrants Enter Between Ports of Entry?

Unauthorized border crossers are, by definition, difficult to observe. U.S. Customs and Border Protection (CBP) and its predecessor, the U.S. Immigration and Naturalization Service (INS),⁵ for decades have estimated illegal entries between ports of entry by using a number that is more readily measured: apprehensions by the U.S. Border Patrol. Apprehensions have been used as a proxy measure of illegal inflows based on the assumption that the proportion of noncitizens apprehended while crossing the border illegally is constant over time and across different border regions. For example, if the Border Patrol regularly apprehends half of all crossers, then the number of apprehensions is equal to the number of successful unauthorized crossings. But if only one-third of crossers are apprehended, then the number of successful crossings is double the number of apprehensions.

In fact, however, the proportion of crossers who are apprehended likely *does* vary as a function of Border Patrol enforcement resources, changes in technology, and other factors. As a result, it is impossible to know whether a drop in apprehensions reflects fewer unauthorized crossing attempts or a higher crossing success rate. Without accurate information about the apprehension *rate*, data on apprehensions fail to provide a specific estimate of actual flows.

In addition to counting apprehensions, three methodologies may be used to estimate illegal inflows between POEs: recidivism analysis (model-based), survey-based, and observational. DHS has been engaged in examining these methodologies for several years. For example, in 2011 CBP announced work on a Border Conditions Index, using a combination of these methodologies, to measure border security. While the effort was abandoned in 2013 and its results never made public, DHS has continued to develop border security standards and methodologies, both for internal purposes and at the consistent urging of

⁴ The Migration Policy Institute (MPI) estimates that just 21 percent of the unauthorized population in 2013 had lived in the United States less than five years; see MPI Data Hub, “Profile of the Unauthorized Population: United States,” accessed January 14, 2016, www.migrationpolicy.org/data/unauthorized-immigrant-population/state/US.

⁵ The U.S. Immigration and Naturalization Service (INS) was abolished and its functions subsumed into DHS in March 2003 as part of a massive restructuring of the federal government subsequent to the September 11, 2001 terrorist attacks.



Congress.⁶ To date, however, none of these approaches have been perfected or deemed adequately reliable for long-term public use, and a widely accepted methodology for measuring illegal flows has not yet been developed.

I. Model-Based Recidivism Analysis

Recidivism analysis estimates illegal border crossings by comparing the total number of apprehensions to the number of individuals who are deported at the border and then later reapprehended (known as recidivists).⁷ The method is “model-based” in that it uses these data points to estimate illegal entries based on a pair of assumptions about (i.e., a model of) immigrant behavior: (1) that all unauthorized immigrants who are apprehended at the border and deported continue to make further attempts to enter the United States until they eventually succeed, and (2) that the probability of apprehension is unchanged over repeated crossing attempts. If these assumptions are correct, then the apprehension rate (the share of intending crossers who are caught) is equal to the ratio of recidivist apprehensions to total apprehensions.

$$\text{Probability of Apprehension} = \frac{\text{Recidivist Apprehensions}}{\text{Total Apprehensions}}$$

For example, if 10,000 people are apprehended in a given month, all of whom (by assumption) make a further illegal entry attempt, and if 5,000 of them are reapprehended, it suggests that the apprehension rate is 50 percent. Once the apprehension rate is known, the number of successful border crossers (i.e., total illegal inflows) can be calculated based on the number of apprehensions:

$$\text{Illegal Inflows} = \frac{\text{Total Apprehensions}}{\left(\frac{\text{Probability of Apprehension}}{1 - \text{Probability of Apprehension}} \right)}$$

CBP has explored recidivism analysis at least since 2011 as part of its work on the Border Conditions Index, but results of this research have not been made publicly available.

a) Advantages and Limitations

The primary advantage of recidivism analysis is that both apprehensions and repeat (recidivist) apprehensions can be measured with a reasonably high degree of precision. Indeed, whereas estimating repeat crossers was problematic during the 1990s, when the methodology for recidivism analysis was developed, since 2000 CBP has collected fingerprint data from almost every apprehended migrant, allowing the agency to reliably identify recidivists.⁸ Thus, recidivism analysis uses known information about apprehensions (Border Patrol counts of total apprehensions have always been considered reliable) to calculate unknown information about illegal inflows.

But like any model, recidivism analysis is limited by the validity of its underlying assumptions: in this case the assumptions that intending crossers continue to attempt to illegally enter until they succeed,

⁶ For a fuller discussion, see Lisa Seghetti, *Border Security: Immigration Enforcement Between Ports of Entry* (Washington, DC: Congressional Research Service, 2014), <https://fas.org/sgp/crs/homesec/R42138.pdf>.

⁷ Recidivism analysis was first proposed by Thomas J. Espenshade, “Using INS Border Apprehension Data to Measure the Flow of Undocumented Migrants Crossing the U.S.-Mexico Frontier,” *International Migration Review*, vol. 29, no. 2 (1995): 545-65. For a fuller discussion of this methodology, see also Seghetti, *Border Security: Immigration Enforcement Between Ports of Entry*; Bryan Roberts, Edward Alden, and John Whitley, *Managing Illegal Immigration to the United States: How Effective Is Enforcement?* (Washington, DC: Council on Foreign Relations, 2013), www.cfr.org/immigration/managing-illegal-immigration-united-states/p30658; Bryan Roberts, *Measuring the Metrics: Grading the Government on Immigration Enforcement* (Washington, DC: Bipartisan Policy Center, 2015), http://bipartisanpolicy.org/wp-content/uploads/2015/02/BPC_Immigration_MeasuringEnforcement.pdf.

⁸ The Border Patrol does not collect fingerprints of children under age 14 or adults ages 65 or older.



and that they are equally likely to be apprehended on every crossing attempt. While the vast majority of people apprehended at the U.S.-Mexico border in the 1990s likely did make repeated entry attempts until they eventually succeeded, the growing share of non-Mexicans among border crossers and CBP's use of increasingly punitive consequences for those apprehended⁹ suggest that a larger share of today's intending unlawful crossers are deterred from crossing after being caught one or more times.¹⁰ In addition, migrants, often with the assistance of sophisticated smugglers, may adapt to an initial apprehension and adopt a different strategy (with a different probability of apprehension) on subsequent crossing attempts. The probability of apprehension also may vary across different portions of the border, and as the Border Patrol adapts its enforcement strategies. To the extent that significant numbers of intending crossers either abandon their plans (in other words are deterred) or change their entry strategies on subsequent crossing attempts, traditional recidivism analysis will yield inaccurate estimates.

b) Potential Improvements

One way to refine the recidivism model is to focus on the overall probability of successful enforcement—i.e., the probability that an intending immigrant is either apprehended or deterred from entering—rather than focusing exclusively on apprehensions. As discussed below, DHS and independent researchers have developed independent estimates of deterrence that could be used for this purpose. Accounting for deterrence in this way results in the following model:

$$\text{Probability of Successful Enforcement} = \frac{\left(\frac{\text{Recidivist Apprehensions}}{\text{Total Apprehensions}} \right)}{1 - \text{Probability of Deterrence}}$$

$$\text{Illegal Inflows} = \frac{\text{Total Apprehensions}}{\left(\frac{\text{Probability of Sucessful Enforcement}}{1 - \text{Probability of Sucessful Enforcement}} \right)}$$

This enhancement more comprehensively captures border dynamics (it produces more valid metrics of enforcement and illegal inflows). But in contrast with the basic recidivism analysis, it relies on a mix of highly reliable CBP data on apprehensions and the number of recidivist apprehensions along with less reliable data on the share of intending migrants who are deterred at the border.

Similarly, data from CBP apprehensions and surveys of intercepted unauthorized crossers provide addi-

⁹ Since 2011, under a program known as the Consequence Delivery System, CBP has substantially decreased its use of voluntary return, a form of deportation with minimal legal or punitive consequences. In its place, the agency has increased its use of more severe forms of deportation, including formal removal orders (such as expedited removal), prosecution in federal court and jail time (including through the Streamline program), and deportation to a different part of the border than where the apprehension occurred (the Alien Transfer Exit Program). See Seghetti, *Border Security: Immigration Enforcement Between Ports of Entry*; Randy Capps, Faye Hipsman, and Doris Meissner, *An Assessment of Consequence Programs Used by the Border Patrol* (Washington, DC: Migration Policy Institute, forthcoming 2016).

¹⁰ Mexicans accounted for about 95 percent of Southwest border apprehensions during the 1990s, and interviews with Mexicans on both sides of the border indicated that virtually all of them made additional crossing attempts, if apprehended, until eventually succeeding. See Espenshade, "Using INS Border Apprehension Data to Measure the Flow of Undocumented Migrants Crossing the U.S.-Mexico Frontier," 549-50. In contrast, non-Mexicans accounted for 44 percent of Southwest border apprehensions in FY 2015, and it is more difficult to attempt to re-enter the United States after being deported to Central America or other more distant countries. In addition, CBP has moved from an enforcement model that relied overwhelmingly on rapid, low-consequence informal removals to one that relies mainly on higher-consequence formal removals and criminal prosecutions; see Marc R. Rosenblum and Doris Meissner with Claire Bergeron and Faye Hipsman, *The Deportation Dilemma: Reconciling Tough and Humane Enforcement* (Washington, DC: MPI, 2014), www.migrationpolicy.org/research/deportation-dilemma-reconciling-tough-humane-enforcement. CBP data suggest that formal removals and criminal prosecutions lead to lower recidivism rates than voluntary returns; see Seghetti, *Border Security: Immigration Enforcement Between Ports of Entry*. As a result, recent evidence from migrant surveys suggests that tougher border enforcement has caused an increasing share of intending migrants to abandon their crossing attempts after one or more apprehensions; see Roberts, Alden, and Whitley, *Managing Illegal Immigration to the United States*, 22-23.



tional information about how border crossers respond to enforcement, including by adopting different strategies on subsequent crossing attempts, and about how recidivism patterns vary across different sections of the border. Inclusion of this information may allow for further refinements to the model-based estimate, though a tradeoff exists in terms of the complexity of the model and the reliability of the data. More generally, analysts could use independent information about deterrence and the probability of apprehension to verify, inform, and refine the assumptions underlying recidivism analysis, yielding more comprehensive estimates of inflows.

2. Survey-Based Research

For many years, surveys of unauthorized immigrants and would-be migrants have contributed significantly to understanding of illegal immigration and the effectiveness of border enforcement and other immigration controls. These surveys are conducted in a range of locations, including migrant-sending communities in Mexico, popular immigrant destinations in the United States, and points along the U.S.-Mexico border. Researchers interview migrants about prior and current trips to the United States, including how many times they attempted to cross the border and how many times they were apprehended before ultimately succeeding or giving up. Using survey results, researchers can calculate the number of people in a given community who intend to migrate, the probability of apprehension, and the share of would-be unauthorized migrants who are successfully deterred from migrating. By extrapolating from the communities sampled to the broader universe of potential unauthorized border crossers, these data points can be used to estimate total inflow.

For many years, surveys of unauthorized immigrants and would-be migrants have contributed significantly to understanding of illegal immigration.

The two largest U.S.-organized surveys are the Mexican Migration Project (MMP) at Princeton University and the Mexican Migration Field Research and Training Program (MMFRP) at the University of California, San Diego.¹¹ MMP employs ethnographic fieldwork and survey techniques to gather social, demographic, and economic information from households in selected communities throughout Mexico (the sample size is 600 to 1,000 households). Researchers then conduct interviews in the United States of unauthorized migrants from the communities sampled in Mexico. These survey results are combined to generate a binational sample.¹²

MMFRP is a similar survey that collects information from households (700-1,000 respondents) in three rural, high-emigration communities in Mexico (in the states of Jalisco, Oaxaca, and Yucatan) and in U.S. communities (mostly in southern California) where such migrants often settle. Because the surveys focus only on a handful of sending communities, they cannot be seen to represent the entire population of Mexican migrants.¹³

A third survey, based in Mexico and called the Encuestas sobre Migración en la Frontera (EMIF, or the Surveys of Migration at the Border), counts north- and southbound flows at busy crossing points in Northern Mexico (EMIF-Norte) and along the Mexico-Guatemala border (EMIF-Sur), in addition to conducting

¹¹ See Mexican Migration Project, "What's the MMP?" accessed January 18, 2016, <http://mmp.opr.princeton.edu/>; Center for Comparative Immigration Studies, University of California, San Diego, "Mexican Migration Field Research and Training Program," accessed January 18, 2016, <http://socialsciences.ucsd.edu/resources/students/opportunities/mexican-migration.html>.

¹² Mexican Migration Project, "Study Design," accessed December 29, 2015, <http://mmp.opr.princeton.edu/research/studydesign-en.aspx>.

¹³ National Research Council, *Options for Estimating Illegal Entries at the U.S.-Mexico Border* (Washington, DC: The National Academies Press, 2013), www.nap.edu/catalog/13498/estimating-illegal-entries-at-the-us-mexico-border.



detailed interviews with a sample of migrants en route to the United States.¹⁴ The sample size of EMIF Norte is 14,000 respondents.¹⁵

All three surveys provide publicly available estimates of the probability of apprehension that can be used to calculate illegal flows. Because the MMP and MMFRP are limited to only a handful of survey sites and have relatively small sample sizes, the results and derivative data points may not be representative of all illicit border crossers or unauthorized Mexican migrants. The larger EMIF sample makes it a more promising source of information on questions such as border apprehensions, though it addresses a more limited set of questions than the two U.S.-organized surveys.

a) ***Advantages and Limitations***

Migrant survey data have the advantage of providing more detailed (and different types of) information about illegal immigration patterns and behaviors than administrative enforcement data. These surveys collect data about migrants' border crossing histories, their motivations for migrating, how long they stay in the United States on any given trip, and how much they paid a smuggler, among many other questions. Because these survey data are based on actual experiences, certain data points—including those for apprehension rates—may be measured directly (albeit, for a limited sample of crossers) rather than being estimated, as in the case of the recidivism model.

Current surveys are not large enough to reliably estimate border-wide flows.

Another advantage of survey-based data is that estimates and indicators from different surveys can be compared and used to corroborate one another, and they provide an alternative to government data on recidivism and other information that is not systematically released to the public. And while sampling limitations make it difficult to verify the accuracy of survey-based results in *absolute* terms, as discussed below, as long as surveys use consistent methods year after year they should produce reliable estimates of *changes* in values over time—a significant advantage given that the three main academic surveys of Mexico-U.S. migration have been administered for between ten and 30 years.

Sampling issues significantly limit survey methodology, however. Most importantly, current surveys are not large enough to reliably estimate border-wide flows. In addition, certain groups of Mexican nationals who do not reside in the small number of communities chosen for the survey (potentially, for example, those living in communities with low emigration rates) may be under-represented (in other words, the samples surveyed are not necessarily representative of the universe of potential unauthorized border crossers). Moreover, while the EMIF survey is designed to capture both Mexican and Central American flows, both U.S.-organized surveys focus on Mexican nationals, who accounted for just 56 percent of border apprehensions in fiscal year (FY) 2015.¹⁶ Additionally, as with any survey about sensitive issues or illegal activity, respondents may not always provide candid responses. It is also time-consuming to conduct and analyze migrant surveys, with the result that such surveys are unable to provide flow or other estimates on a timely basis.

14 See El Colegio de la Frontera Norte, "Encuesta sobre Migración en la Frontera Norte de México," accessed January 15, 2016, www.colef.mx/emif/; National Research Council, *Options for Estimating Illegal Entries*.

15 National Research Council, *Options for Estimating Illegal Entries*.

16 DHS, "DHS Releases End of Fiscal Year 2015 Statistics," (news release, December 22, 2015), www.dhs.gov/news/2015/12/22/dhs-releases-end-fiscal-year-2015-statistics.

**b) Potential Improvements**

Several improvements could make migrant surveys a more promising tool to estimate illegal inflows. First, an investment of additional resources could expand the sample size and scope of such surveys, yielding more accurate and detailed information.

With unauthorized Mexican inflows at a 40-year low and Central American migration at historically high levels, efforts to gather additional data in Central America and along the transit routes Central Americans take would be especially helpful.¹⁷ In general, such efforts could focus on creating or expanding existing academic or private-sector surveys, including through federal research grants.

Immigration data collection also could be incorporated into the federal government's existing survey infrastructure. For example, the U.S. Census Bureau could include relevant migration-related questions in the American Community Survey (ACS) or Current Population Survey (CPS) or could conduct a separate survey designed to identify unauthorized immigrant households.

Finally, new questions addressing these issues could also be added to a questionnaire that is given to each person apprehended by the Border Patrol as part of the agency's intelligence-gathering efforts. By partnering with private-sector or academic researchers, the Border Patrol may also be able to gather valuable information about individuals' previous migration histories.¹⁸

3. Observational Analysis

Since the mid-2000s, the Border Patrol has systematically recorded a variety of metrics based on agents' observations. In addition to apprehensions, these metrics include "turnbacks," or individuals who attempt to enter without inspection but are deterred from doing so, often as a result of Border Patrol presence or dangerous conditions; and "gotaways," or individuals who are detected but evade arrest and cross successfully.¹⁹ These data are not generally made available to the public.

To estimate turnbacks and gotaways, agents in each sector use a combination of surveillance footage taken by aircraft or fixed cameras, information from ground- or motion sensors, ground observations, and techniques to observe the terrain and track the movement of people (known as "sign cutting"). The total illegal inflow can be estimated by adding the number of gotaways border-wide.

a) Advantages and Limitations

The primary advantage of the observational methodology is that it is based on actual, real-time border activity. In theory, if the entire U.S.-Mexico border was accurately monitored 100 percent of the time, the Border Patrol would have a full picture of how many migrants attempt to cross without authorization, and how many succeed and fail.

¹⁷ One model that could be replicated is the 2013 survey of returning Salvadoran migrants conducted jointly by the U.S. Committee for Refugees and Immigrants (USCRI) and the Universidad Tecnológico de El Salvador (UTES) in cooperation with El Salvador's government-run "Welcome Home" program, which greets deportees at the San Salvador airport; see USCRI and UTES, *A Profile of the Modern Salvadoran Migrant* (Washington, DC: USCRI, 2013), <http://refugees.org/wp-content/uploads/2015/12/A-Profile-of-the-Modern-Salvadorean-Migrant-English.pdf>.

¹⁸ See for example, Mark Grimes, Elyse Golob, Alexandra Durcikova, and Jay Nunamaker, *Reasons and Resolve to Cross the Line: A Post-Apprehension Survey of Unauthorized Immigrants along the U.S.-Mexico Border* (Tucson: University of Arizona, National Center for Border Security and Immigration, 2013), www.borders.arizona.edu/cms/sites/default/files/Post-Aprehension-Survey-REPORT%20may31-2013_0.pdf.

¹⁹ Border Patrol agents are instructed to record a turnback if the observing agent believes the border crosser intends to stay in the United States but Border Patrol activities caused the individual to return to Mexico. A gotaway is an individual who is detected by the Border Patrol but not apprehended, and continues traveling to the U.S. interior without being actively pursued; see Government Accountability Office (GAO), *Key Elements of New Strategic Plan Not Yet in Place to Inform Border Security Status and Resource Needs* (Washington, DC: GAO, 2012), www.gao.gov/assets/660/650730.pdf.



Box 1. Explaining the Difference between Apprehension Rate and Effectiveness Rate

Each of the three methodologies described in this report for estimating illegal inflows can be used to calculate the apprehension rate—the percentage of attempting border crossers who are apprehended by the Border Patrol. The higher the apprehension rate, the more successful U.S. Customs and Border Protection (CBP) is at detecting and intercepting border crossers. In general, the apprehension rate is defined as follows:

$$\text{Apprehension Rate} = \frac{\text{Total Apprehensions}}{\text{Total Crossing Attempts} (= \text{apprehensions} + \text{illegal inflows})}$$

Since 2006 the Border Patrol has used its observational data to calculate an “effectiveness rate,” a variation on the apprehension rate that adopts a broader definition of total crossing attempts for its denominator:

$$\text{Effectiveness Rate} = \frac{\text{Total Apprehensions}}{\text{Total Attempts} (= \text{apprehensions} + \text{turnbacks} + \text{gotaways})}$$

Certain legislative proposals introduced in recent years would require the Border Patrol to report on its effectiveness rate, and some have proposed using a 90 percent effectiveness rate as a “trigger” for legalization provisions in comprehensive immigration reform legislation.

But surveillance does not cover the entire border region. Technology and intelligence assets tend to be concentrated in urban areas and other stretches of the border with the most illegal immigration and smuggling activity, leaving gaps in remote areas with difficult terrain and limited traffic. Even in high-traffic areas, surveillance coverage is incomplete, as migrants may slip into the urban landscape in cities and evade detection in rural and suburban areas. And there is no way to account for border crossers who go completely undetected by surveillance.

A second limitation is that information from sensors, cameras, and other technological devices are not linked or automated and cannot easily be condensed into discrete counts of illegal crossings and smuggling activity. For example, double-counting is a key concern: a group of migrants traveling north might be counted once by the Border Patrol agent who initially spotted them and again if there is a shift change, or they cross into a different zone, and a second agent begins to track them. Similarly, a group that disappears and reappears in surveillance footage could be counted twice. Counting turnbacks and gotaways also relies extensively on interpretation, and agents therefore may overestimate turnbacks and underestimate gotaways.

Lastly, data-collection methods and definitions of turnbacks and gotaways are not entirely consistent across Border Patrol sectors.²⁰

b) Potential Improvements

Observational border security measures could be improved in a number of ways. A transparent and uniform counting method, employed by agents across all Border Patrol sectors, would ensure consistency and minimize double-counting.²¹ This methodology could also be improved if air surveillance were expanded along the entire border and around the clock, allowing DHS to capture all crossing activity between ports

20 GAO, *Key Elements of New Strategic Plan Not Yet in Place to Inform Border Security Status and Resource Needs*.

21 The Border Patrol issued new guidance in September 2012 designed to impose greater consistency on data collection and reporting on turnbacks and gotaways, but information about the new system and its data are not yet publicly available. See Seghetti, *Border Security: Immigration Enforcement Between Ports of Entry*.



of entry. A similar but far less expensive option would be to place surveillance technology and assets in select areas that are representative of the whole border, and then generate counts of gotaways and turnbacks based on this statistical sample.

Box 2. Measuring Deterrence Rates

Both observational methods and surveys of migrants produce estimates of the deterrence rate, or what proportion of would-be crossers are successfully discouraged from completing an illegal entry attempt. Deterrence at the border is measured through CBP's observational counts of turnbacks and through surveys that ask respondents about their border-crossing experiences.

The Border Patrol has identified deterrence as the central goal of its border enforcement strategy in recent decades. Knowing the share of intending migrants successfully deterred is also an important piece of data for producing accurate model-based estimates of illegal inflows.

Apart from the proportion of migrants deterred at the border, an additional metric of successful enforcement is "remote deterrence:" the number (or share) of potential migrants who are discouraged even from undertaking a trip to the border. In many ways, remote deterrence is the ultimate measure of effective enforcement: if the border is known to be secure, few will initiate an illegal trip. By its nature, remote deterrence is difficult to measure, but surveys conducted in communities of origin typically question people about their intentions, and the factors that influence their migration plans. Such surveys also attempt to document cases in which people choose not to migrate unlawfully because of the perceived costs or difficulty of doing so.

B. How Many Unauthorized Immigrants Enter Through Ports of Entry?

The debate over illegal immigration has centered squarely on control between ports of entry, with limited attention to illegal entries through U.S. air, land, and sea ports. Anecdotal evidence suggests illegal flows through POEs may be increasing.²²

Migrants may cross unlawfully through POEs in one of two ways: (1) using fraudulent documents—including counterfeit documents and valid documents that belong to another person; or (2) by hiding in private or commercial vehicles or shipping containers. Migration control is not the top priority at POEs because authorities must also facilitate lawful travel and trade, volumes of which are both very high in many ports, making detection of unauthorized migrants difficult. (For example, approximately 1 million travelers pass through U.S. ports every day).²³

Illegal flows through POEs remain poorly understood, and the vast differences between operations at the ports and the unauthorized entry behaviors seen there versus those occurring between the ports of entry mean that distinctive methodologies are necessary to estimate illegal inflows through ports.

I. Observational Measure: The COMPEX Program

CBP uses its Random Compliance Examination (COMPEX) program to estimate illegal flows through

²² See for example, Wayne Cornelius, Micah Gell-Redman, Hillary S. Kosnac, Pedro Lewin-Fischer, and Veronica Noriega, eds., *The New Face of Mexican Migration: A Transnational Community in Yucatán and California* (La Jolla, CA: University of California, San Diego, Center for Comparative Immigration Studies, 2015).

²³ CBP, "On a Typical Day in Fiscal Year 2014, CBP..." accessed January 15, 2016, www.cbp.gov/newsroom/stats/typical-day-fy2014.



ports of entry.²⁴ COMPEX selects a random sample of air passengers and vehicles at land ports that have been cleared through the normal port inspection process and subjects them to a more rigorous “secondary” inspection that includes interviews, additional document checks, vehicle inspections, and, in some cases, fingerprinting.

CBP calculates the percentage of admitted travelers that COMPEX subsequently finds to be unauthorized, along with overall admissions numbers, to estimate how many violations go undetected and thus get a measurement of total illegal inflows through ports:

Illegal Inflows

$$= \text{Proportion of POE travelers found to be unauthorized in COMPEX sample} \times \text{Total POE entries}$$

However, the estimates are not reported to the public or provided to outside researchers.²⁵

a) Advantages and Limitations

In theory, estimating illegal inflows at ports of entry should be easier than estimating such flows between the ports because CBP knows with certainty what percentage of admitted travelers are being screened. (In contrast, the great challenge between ports of entry is uncertainty about the total population of intending crossers—a problem that does not exist at POEs.) Moreover, COMPEX has broad coverage; the program reportedly operates at airports that account for more than 80 percent of all air traffic to the United States, and at land ports that represent 95 percent of vehicle volume.²⁶ Thus, to the extent that COMPEX constructs a statistically valid sample of all inflows at the ports, the program should produce accurate estimates of the number of violations that go undetected.

However, COMPEX has several important limitations. First, its use is currently confined to air passengers and private vehicles at land ports. It excludes sea passengers, maritime cargo containers, commercial trucks, and pedestrians. As a result, COMPEX does not capture two of the most common ways migrants enter illegally through ports of entry: as pedestrians with false documents or as stowaways in commercial vehicles.²⁷ (COMPEX was developed in 1999 by the former U.S. Customs Service, which was later rolled into DHS, and historically has focused more on identifying customs violators than unauthorized immigrants.)

COMPEX does not capture two of the most common ways migrants enter illegally through ports of entry.

Second, fingerprints are not always collected during COMPEX screening. As a result, COMPEX may not detect cases in which crossers use borrowed or stolen documents—potentially a large share of illegal entries through land POEs. Third, while COMPEX relies on a computer-generated random sampling design at airports, sampling at land ports is based on manual selection, leaving the program vulnerable to sampling

24 CBP also collects data on successful enforcement at ports of entry, including the number of individuals denied admission at ports of entry due to previous immigration violations or for criminal or national security-related reasons, as well as the number of migrants placed in removal proceedings; CBP, “CBP Fiscal Year 2013 in Review,” January 17, 2014, www.cbp.gov/newsroom/local-media-release/2014-01-17-000000/cbp-fiscal-year-2013-review.

25 According to CRS, the program screened 184,000 air passengers and 456,000 vehicles at land ports of entry in FY 2012; CRS reported that “overall a very small percentage of travelers in the sample were found to have committed a major violation.” See Lisa Seghetti, *Border Security: Immigration Inspections at Ports of Entry* (Washington, DC: Congressional Research Service, 2015), <https://fas.org/sgp/crs/homesec/R43356.pdf>.

26 Seghetti, *Border Security: Immigration Inspections at Ports of Entry*.

27 The COMPEX program reportedly planned to begin sampling pedestrians entering through ports of entry during FY 2015. See Seghetti, *Border Security: Immigration Inspections at Ports of Entry*.



errors. The program is also sometimes suspended during high-volume periods to speed processing.²⁸

Lastly, given the large volume of flows through ports of entry and the relatively rare incidence of violations, a very large sample is necessary to produce statistically valid estimates. It is unclear from the limited public information about the program whether COMPEX collects a large enough sample at each of its ports to provide accurate estimates of the different types of potential violations.

b) Potential Improvements

Expanding COMPEX screening to commercial vehicles and pedestrians crossing at land ports of entry would significantly improve COMPEX-based flow estimates. This would increase the overall sample size and ensure all of the ways migrants enter illegally at ports of entry are measured. (The sample sizes for each type of port traffic would also need to be relatively large.) Additionally, collecting fingerprints for all individuals screened through COMPEX would improve accuracy of estimates for how many migrants enter the United States using fraudulent documents. A COMPEX flow estimate along with the number of individuals denied admission by CBP officers at ports of entry for immigration reasons could be used to calculate a detection rate at ports of entry:

$$\text{POE Detection Rate} = \frac{\text{Number denied admission at POEs}}{(\text{Number denied admission} + \text{COMPEX estimate illegal inflows})}$$

Box 3. Border Crossing Costs

The cost of illegal entry—i.e., how much migrants pay (in bribes, smuggling fees, and other expenses) to enter illegally at or between ports of entry—is another useful indicator of border security. The more effective border enforcement is, the more difficult it is to cross the border, and the greater the demand for—and costs of—migrant smuggler services. As an illicit market, smugglers (and corrupt officials) can only charge what the market will bear, making smuggling fees a highly reliable indicator of how difficult it is to enter the United States.

Three migrant surveys: the Mexican Migration Project (MMP), Mexican Migration Field Research and Training Program (MMFRTP), and the Encuesta sobre Migración en la Frontera Norte de México (EMIF) question respondents about the cost of hiring a smuggler. Since the 1990s, Border Patrol agents also have asked apprehended migrants a series of questions for intelligence-gathering purposes, including whether they used a smuggler and how much they paid. Despite the sampling challenges inherent in migrant surveys, the MMP, MMFRTP, EMIF, and DHS administrative data all indicate an upward trend in smuggling costs since the 1990s. However, DHS's apprehension questionnaire shows much lower reported use of smugglers and smuggling costs than the nongovernmental survey data, suggesting that apprehended crossers may be less candid with U.S. immigration officials than with researchers, particularly when it comes to information about smugglers.

For a fuller discussion, see DHS, Office of Immigration Statistics, *An Analysis of Migrant Smuggling Costs Along the Southwest Border* (Washington, DC: DHS, Office of Immigration Statistics, 2010), www.dhs.gov/xlibrary/assets/statistics/publications/ois-smuggling-wp.pdf.

²⁸ Testimony of Colleen M. Kelley, President, National Treasury Employees Union, before House Committee on Homeland Security, Subcommittee on Border and Maritime Security, *Cargo Security Threats at Land Ports of Entry*, 111th Cong., 1st sess., October 22, 2009, www.gpo.gov/fdsys/pkg/CHRG-111hrg57596/html/CHRG-111hrg57596.htm.



COMPEX results should also be released to the public, allowing outside researchers to validate the program's statistical design and sample size. Depending on the results of such analysis, COMPEX's overall sampling frame may need to be expanded to ensure that it produces accurate estimates of illegal inflows.

"Red-team" techniques also could be employed to learn more about the effectiveness of immigration enforcement at ports of entry. Government agencies and other entities—particularly in security, defense, and cyber operations—often employ red teams to detect security vulnerabilities using covert testing. In the border security context, red teaming would involve attempts by undercover individuals or "testers" to enter the United States at ports of entry using various false documents or concealed in vehicles. Successful entries compared to the number of times testers are denied admission because their violations were detected by a CBP officer would yield an additional measure of the POE detection rate.²⁹

C. How Many People Overstay Temporary, Nonimmigrant Visas?

By some estimates, one-third to half of unauthorized immigrants do not enter illegally at or between a port of entry, but instead come lawfully to the United States with a temporary, nonimmigrant visa and remain in the country after their visas expire or otherwise violate the terms of their visas.³⁰ They are often referred to as visa overstayers. Though enumerating overstayers is crucial to measuring illegal immigration flows, the government went 19 years between the last overstaying report published by the INS, in 1997, and the first such report published by DHS, in January 2016.³¹ Private-sector research on the issue was released only sporadically during the interim.³² The new DHS overstaying report is limited to a subset of the nonimmigrant population: those entering by air or sea carriers as visitors for business or pleasure³³ who were scheduled to depart the United States between October 2014 and September 2015—a total of nearly 45 million visitors. The report finds that 527,127 of these individuals overstayed their admission for some period of time, for a total overstaying rate of 1.17 percent.³⁴ More than 100,000 of these initial overstayers had departed the country by January 4, 2016, leaving 416,500 individuals who DHS believed to remain in the United States, for an in-country overstaying rate of 0.9 percent.³⁵

To count overstayers directly, records of nonimmigrant arrivals must be compared to nonimmigrant departures, controlling for those who change their visa status to lawfully extend their stays. If every arrival record can be successfully matched to a departure record or a visa extension, then there are no overstayers. More generally, the number of overstayers is equal to the difference between nonimmigrant arrivals and departures.

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- 29 Red-team testing could also be used between ports of entry in theory. However, significant safety risks associated with clandestine border crossing between ports prevent this from being a realistic option. For a fuller discussion of red-teaming to measure border security, see Micah Zenko, *Red Team: How to Succeed By Thinking Like the Enemy* (New York: Basic Books, 2015); Andrew R. Morral, Henry H. Willis, and Peter Brownell, *Measuring Illegal Border Crossing Between Ports of Entry: An Assessment of Four Promising Methods* (Santa Monica, CA: RAND Homeland Security and Defense Center, 2011), www.rand.org/pubs/occasional_papers/OP328.html.
- 30 DHS, "Illegal Alien Resident Population," accessed January 18, 2016, www.dhs.gov/xlibrary/assets/statistics/illegal.pdf; Pew Hispanic Center, "Modes of Entry for the Unauthorized Migrant Population;" Warren and Warren, "A Review of the Declining Numbers of Visa Overstays in the U.S. from 2000 to 2009."
- 31 DHS, *Entry/Exit Overstay Report, Fiscal Year 2015* (Washington, DC: DHS, 2016), www.dhs.gov/publication/entryexit-overstay-report.
- 32 Pew Hispanic Center, "Modes of Entry for the Unauthorized Migrant Population;" Warren and Warren, "A Review of the Declining Numbers of Visa Overstays in the U.S. from 2000 to 2009."
- 33 Visitors for business or pleasure include nonimmigrants on B1/B2 visas and those entering through the Visa Waiver Program; DHS's overstaying analysis does not yet include nonimmigrants in other visa categories, such as foreign students and temporary workers.
- 34 DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*.
- 35 By using data on admissions, which could encompass multiple entries by the same individual on different occasions, rather than examining overstays by individual, DHS may be producing a lower overstaying rate. See Jessica Vaughan, "DHS Reports Huge Number of Visitors Overstayed in 2015" (blog posting, Center for Immigration Studies, January 20, 2016), <http://cis.org/vaughan/dhs-reports-huge-number-visitors-overstayed-2015>.



The basic obstacle to counting overstayers is that the United States, unlike most European countries, does not require travelers to pass through an immigration inspection process prior to exiting the country; and U.S. ports of entry generally lack the infrastructure for collecting data from exiting travelers. As a result, while DHS collects accurate data on arrivals, the department does not directly collect departure data. To combat this limitation, Congress in 1996 required INS to develop and implement an automated entry-exit control system by 1998 that would collect and automatically match records of noncitizen arrivals and departures and thereby identify and enumerate visa overstayers.³⁶ Despite this longstanding mandate, direct exit data collection by DHS has been limited to a series of pilot programs, as discussed below. Efforts to estimate overstays mainly have relied on three alternative methodologies: indirect departure records, model-based estimates, and third-party data collection.

I. Indirect Departure Records

Prior to 1997, INS estimated the number of overstayers by examining indirect departure records through paper I-94 forms filled out by nonimmigrant travelers at the time of their entry to the United States that were to be returned upon departure. INS collected the paper departure records, and a contractor transferred the data to an electronic file, which could then be compared to the agency's arrival database. INS used data from the paper I-94 forms to produce estimates of visa overstayers in 1994 and 1997;³⁷ until DHS issued its report in January 2016 these remained the most recent publicly available official overstay estimates.

Advantages and Limitations

The primary advantage of collecting departure data through paper forms is that no new departure infrastructure was required. Travelers handed their paperwork to border officials or dropped forms at centralized collection points on their way through a departure gate. But it was problematic to rely on travelers to submit their own paperwork because many lost their forms or failed to hand them in. The system was also vulnerable to fraud, for example if a departing traveler handed in multiple forms. Paper forms were also inefficient because they required a labor-intensive data entry process. For these reasons, INS abandoned the effort to track exits through paper I-94 forms in 1997. Today, CBP gathers arrival and departure information automatically from electronic travel records for air and sea passengers; the paper I-94 form still is issued at land POEs, though I-94 departure forms are only submitted on a voluntary basis.³⁸

2. Model-Based Estimates

Since 1997, nongovernmental analysts have estimated the number of overstays based on a statistical model drawn from the distribution of visa overstayers outlined in the 1997 INS analysis of I-94 data. In particular, researchers have assumed that the current share of unauthorized immigrants who are visa overstayers, broken down by country of origin and year of arrival, is similar to the share of unauthorized immigrants who were visa overstayers in the 1997 analysis, broken down by country of origin and year of arrival. For example, if 10 percent of unauthorized Mexican immigrants and 95 percent of unauthorized Irish immigrants in 1997 were visa overstayers, analysts assume the same overstay rates for these populations today, with certain adjustments based on historical developments. Given these assumptions, it is possible to estimate the number of overstayers based on a demographic portrait of the unauthorized population.³⁹ With DHS publication of the 2016 overstay report, existing model-based estimates may be updated

³⁶ *Illegal Immigration Reform and Immigrant Responsibility Act of 1996*, Division C of Pub.L. 104-208, 110 Stat. 3009-546, §110.

³⁷ DHS, "Illegal Alien Resident Population," Robert Warren, "Estimates of the unauthorized immigrant population residing in the United States, by country of origin and state of residence: October 1992" (unpublished paper, presented at the annual meeting of the Population Association of America, Miami, Florida, May 5-7, 1994), www.popline.org/node/289723.

³⁸ CBP, "Arrival/Departure Forms: I-94 and I-94W," accessed January 15, 2016, www.cbp.gov/travel/international-visitors/i-94-instructions; DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*, 10

³⁹ For a fuller discussion, see Pew Hispanic Center, "Modes of Entry for the Unauthorized Migrant Population," Warren and Warren, "A Review of the Declining Numbers of Visa Overstays in the U.S. from 2000 to 2009."



to reflect the latest information on overstay rates by country of origin.

Advantages and Limitations

In the absence of complete observational data on nonimmigrant exits, some form of statistical modeling is the only way to estimate the number of visa overstays in the overall unauthorized population. Moreover, the basic methodology behind these models is sound: if the share of unauthorized Mexicans who are visa overstayers is known, and the number of unauthorized Mexicans is known, then estimating the number of Mexican visa overstayers is uncomplicated.

At the same time, however, these estimates are only as good as the underlying assumptions that inform them; and many of those assumptions are still based on nearly two decade-old INS research, which was arguably problematic even at that time. In addition, to the extent that tougher border enforcement has prevented some illegal entries, visa overstayers may represent a larger share of unauthorized immigrants than these model-based estimates suggest. Going forward, production of an accurate estimate of the number of overstays within the overall unauthorized population will require more complete information about overstayers who entered via air or sea ports (i.e., covering additional nonimmigrant visa categories besides visitors for business and pleasure, and covering a longer window of scheduled departure dates) and updated information about land border entrants who overstay.

3. Direct Collection of Exit Data

Between 2004 and 2010, DHS tested four pilot programs to collect data directly from travelers at certain land and air ports of entry. The programs included biometric (fingerprint) data collection by CBP and Transportation Security Administration (TSA) officials at air and seaports, Radio Frequency Identification Data (RFID) collection at certain land POEs from RFID tags added to travelers' nonimmigrant visa documents,⁴⁰ and biometric (fingerprint) data collection at certain land POEs.⁴¹ In each of these pilot programs, CBP or TSA officers were stationed at or near points of departure to collect data from travelers or from their documents.

In summer 2015, CBP began collecting biometric exit data from passengers departing on selected international flights from ten U.S. airports, and in January 2016 DHS announced plans to test additional biometric data collection in a field trial set to begin in 2016.⁴² In December 2015, DHS also announced a pilot program, scheduled for February – June 2016, to collect exit data from land border travelers departing through the pedestrian lane at the Otay Mesa port of entry near San Diego, CA. Under the program, CBP plans to collect biographic data (a document swipe) from all departing travelers as well as biometric data (an iris scan) from certain noncitizens who would also provide biometric data when entering the United States.⁴³

Advantages and Limitations

Given its role collecting and managing traveler arrival data, CBP would be the appropriate government agency to collect similar data from exiting travelers. In particular, CBP officers have appropriate training to collect biometric data such as a fingerprint or iris scan, rather than only collecting biographic data (e.g., names, birth-dates, etc.) by examining or swiping a travel document. In contrast, third-party data collection by the government of Canada and by air and sea carriers is limited to biographic data, as discussed below. The advantage to collecting biometric data is that it guards against exit data identity fraud, that is, a traveler exiting under

⁴⁰ Radio Frequency Identification (RFID) is a wireless technology for sharing electronic data. The technology is used, among other places, in implants to identify lost pets, in automated highway toll collection, and in U.S. passports issued since 2007.

⁴¹ For a fuller discussion see Seghetti, *Border Security: Immigration Inspections at Ports of Entry*.

⁴² DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*, 3.

⁴³ Sandra Dibble, "Otay Mesa border crossing launches testing of facial recognition technology," *Los Angeles Times*, December 3, 2015, www.latimes.com/local/california/la-me-1213-border-biometrics-20151213-story.html.



another person's name.

Despite the potential benefits of CBP playing a direct role in exit data collection, however, none of the previous CBP (or TSA) exit data pilot programs were expanded or made permanent. The primary lesson from these pilot programs was that the absence of exit control infrastructure at U.S. ports of entry is a formidable obstacle to the government's collection of exit data.⁴⁴ As DHS notes in its new overstay report: "The United States did not build its border, aviation, and immigration infrastructure with exit processing in mind."⁴⁵ In its new biometric exit pilot programs, CBP has focused on more flexible technologies, including mobile collection devices and rapid iris scan technologies. It remains to be seen whether these technologies can be scaled up to cover the full population of exiting travelers at an acceptable cost, particularly in light of the questionable advantages of biometric data versus third-party biographic data, as discussed in the conclusion.

The benefits of exit data collection by the government must be weighed against the costs of longer wait times for outbound travelers and CBP's mission to facilitate trade and mobility. At the time of this report's publication, no information was publicly available about CBP's exit data pilot programs at certain U.S. airports or the land border pilot program at Otay Mesa.

4. Third-Party Exit Data Collection

Given these obstacles, the primary way DHS currently collects exit data is through information-sharing agreements with third parties, such as airlines, that already have systems in place to collect traveler data. First, under the Advanced Passenger Information System (APIS) program, air and sea carriers are required to provide CBP with passenger lists for all international air and sea departures. DHS reports that air carriers comply with APIS requirements close to 100 percent of the time.⁴⁶ ICE's Overstay Analysis Unit reportedly compares APIS air and sea exit data with CBP entry data to generate a list of suspected air and sea visa overstayers.⁴⁷

Second, under the U.S.-Canada Beyond the Border Agreement signed in 2011, the two countries have deployed an integrated entry-exit system at almost all of their common land ports. Under this system, CBP and the Canadian Border Services Agency (CBSA) automatically share records of travelers crossing the border, with Canadian entry data serving as a record of U.S. exits and vice versa. The program is operational for all non-U.S. and non-Canadian citizens, and it will eventually include all border crossers.⁴⁸ CBP reconciles more than 99 percent of nonimmigrant Northern border land entry records against the Canadian data,⁴⁹ suggesting the ability to use this system to enumerate suspected overstayers who entered via the Northern border.

⁴⁴ For a fuller discussion see Seghetti, *Border Security: Immigration Inspections at Ports of Entry*.

⁴⁵ DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*.

⁴⁶ David F. Heyman, John Wagner, and John Woods, testimony of U.S. Customs and Border Protection and U.S. Immigration and Customs Enforcement for a House Committee on Homeland Security, Subcommittee on Border and Maritime Security hearing, *Fulfilling A Key 9/11 Commission Recommendation: Implementing Biometric Exit*, 113th Cong., 1st sess., September 25, 2013, <http://docs.house.gov/meetings/HM/HM11/20130926/101264/HHRG-113-HM11-Wstate-WagnerJ-20130926.pdf>.

⁴⁷ GAO, *Overstay Enforcement: Additional Actions Needed to Assess DHS's Data and Improve Planning for a Biometric Air Exit Program*, GAO-13-683 (Washington, DC: GAO, 2013), www.gao.gov/assets/660/656316.pdf.

⁴⁸ DHS, *2014 Beyond the Border Implementation Report to Leaders* (Washington, DC: DHS, 2015), www.dhs.gov/sites/default/files/publications/15_0320_15-0745_BTB_Implementation_Report.pdf.

⁴⁹ DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*, 3.



a) Advantages and Limitations

The primary advantage of these third-party programs is that data collection is seamlessly included in the existing travel process. Air and sea carriers routinely collect passenger manifests, and Canada already checks travel documents for every incoming traveler at land POEs. For carriers and CBSA to provide these data to DHS has no impact on the exiting traveler's border experience; and data are collected at virtually no additional cost to any of the actors involved.

These third-party programs are limited in three main respects, however. Most importantly, Mexico does not collect entry data from most southbound travelers, so no exit data are collected (even indirectly) at Southern border land ports. As a result, the United States has very limited information on nonimmigrants (including those with border crossing cards) entering the United States from Mexico who fail to depart the country before their temporary visas expire.⁵⁰

Second, while CBP collects biometric data from most incoming travelers, data collected by air and sea carriers and by CBSA are limited to biographic information based on travel documents, as noted above.⁵¹ As a result, while these systems are good at counting the number of travelers leaving the United States, they are not able to confirm exiting travelers' identities, a problem discussed in greater detail in the conclusion.

Third, as with the COMPLEX program, until the release of its overstay report on January 19, 2016, DHS had released little information to Congress or to the research community about its analysis of exit data and its current overstay estimates. The INS was directed to collect data on overstays beginning in 1997, and Congress has added several related requirements since then. But until this new release, no overstay report had been submitted to Congress since 1997. The lack of transparency about the government's efforts to identify overstayers is especially important because a 2013 Government Accountability Office (GAO) report found 1.2 million mismatched entry and exit records, leading GAO to raise questions about the quality of DHS overstay data.⁵²

b) Potential Improvements

While the model-based approaches discussed above offer a useful starting point for estimating the number of overstayers, confidence in these estimates and concrete knowledge about overstayers would be greatly increased if these estimates were supplemented or replaced with information based on more complete analysis of current arrival and departure data.

To produce a reliable overstay count would require two key steps. First, DHS must begin collecting exit data—directly or indirectly, and at least for a representative sample of travelers—from those departing by land across the Southwest border. Second, even in the case of air and sea travelers and those entering at the Northern border, where DHS already (indirectly) collects exit data, the department still must expand on its January 2016 overstay report to reconcile entry and exit data while controlling for visa renewals for all classes of nonimmigrant travelers and thus to produce a complete overstay count. DHS will be unable to produce an accurate estimate of visa overstayers until both of these steps are completed, at least to

⁵⁰ The absence of Southern border exit data also prevents an accurate estimate of air, sea, and Northern border visa overstayers because travelers who enter through these ports and then exit at the Southern border are inaccurately registered as overstayers.

⁵¹ Document-based data should be considered biographic even if they come from biometrically enabled travel documents (e.g., a driver's license that includes fingerprint information) because scanning a biometric document does not prove that the document belongs to a particular traveler. Only data based on a scan of a person's body (i.e., fingerprints, retinas, facial structure, etc.) can properly be considered biometric.

⁵² GAO, *Overstay Enforcement: Additional Actions Needed to Assess DHS's Data and Improve Planning for a Biometric Air Exit Program*, 16-18.



some degree.

Two additional potential improvements to the existing exit data collection system would be to shift from indirect data collection by air and sea carriers and the government of Canada to direct data collection by CBP, and to shift from biographic to biometric data. CBP is better able to collect biometric data than potential third-party partners. And relying on CBP would give the U.S. government more control over data collection. Collecting biometric data would bring DHS into compliance with statutory mandates established by Congress in 1996 with the *Illegal Immigration Reform and Immigrant Responsibility Act* (IIRIRA), as amended, and more reliably identify exiting travelers. But the practical benefits that would come from these improvements would be limited compared to the high costs of establishing such a system, as discussed in the conclusion.

D. **How Many Unauthorized Immigrants Live in the United States?**

As with the three other central questions about illegal flows and visa overstays, there is no definitive data source on the unauthorized population because unauthorized immigrants are reluctant to be identified and counted.

The U.S. Census Bureau conducts three major surveys of the total U.S. population: the decennial Census, which seeks to enumerate every person in the country; the annual American Community Survey (ACS), which surveys a nationally representative sample of households; and the monthly Current Population Survey (CPS), which surveys a (smaller) nationally representative sample of households. The decennial census no longer collects any information about birthplace or citizenship status.⁵³ The ACS and CPS both collect information about country of birth and citizenship status, but they do not ask noncitizens about their immigration status and so do not provide a direct estimate of the unauthorized population.

I. The Residual Method

In the absence of Census data on the unauthorized population, DHS and analysts outside the government employ the so-called residual method to estimate the total number of unauthorized immigrants.

In short, the residual method involves four steps. First, U.S. Census data (typically ACS) are used to calculate the total noncitizen population based on Census questions about birthplace and citizenship status. Second, analysts estimate the number of legal noncitizens in the United States based on DHS data on previous lawful immigration, including the numbers of permanent immigrants, temporary nonimmigrants (e.g. international students or people on long-term nonimmigrant visas such as the H-1B), refugees, and asylum recipients. The total number of legal migrants is then adjusted downward to account for deaths and emigration. Third, the number of legal noncitizens is subtracted from total noncitizens. The difference (or “residual”) is the estimated unauthorized population. Finally, the estimated residual is adjusted upwards by a certain percentage to account for the fact that foreign-born residents in general, and unauthorized immigrants in particular, are less likely than the native born to respond to Census questionnaires.⁵⁴

DHS, the Pew Research Center, and the Center for Migration Studies of New York (CMS) each produce independent estimates of the total unauthorized population using the residual method, along with sepa-

⁵³ With the advent of the American Community Survey (ACS) in 2005, the Census Bureau in 2010 eliminated the decennial census’ use of the traditional “long form” that had previously been distributed to one out of six Census households; long-form questions are now included as part of the ACS. See U.S. Census Bureau, “American Community Survey,” accessed January 18, 2016, www.census.gov/history/www/programs/demographic/american_community_survey.html.

⁵⁴ For a fuller discussion, see Robert Warren and John Robert Warren, “Unauthorized Immigration to the United States, Annual Estimates and Components of Change, by State, 1990 to 2010,” *International Migration Review*, vol. 47 no. 2 (2013): 296–329, <http://onlinelibrary.wiley.com/doi/10.1111/imre.12022/epdf>.



rate calculations for certain country-of-origin groups and regions.⁵⁵

a) Advantages and Limitations

This general approach to estimating the unauthorized population is a proven methodology that analysts have refined over a 20-year period. Working separately, Pew, DHS, and CMS used the residual method to arrive at independent estimates of the unauthorized population for the 2012-13 period of between 11.1 million and 11.3 million people, placing their estimates within less than 3 percentage points of each other. All three organizations publish detailed appendices explaining their methodologies.⁵⁶

In addition to these estimates of the *size* of the unauthorized population, the Migration Policy Institute (MPI), Pew, and CMS each have developed methodologies to identify likely unauthorized immigrants at the individual level within the ACS microdata. These organizations use their status assignments in the microdata to produce far more detailed descriptions of the *characteristics* of the unauthorized population, including recency of arrival, education and income levels, and English proficiency.⁵⁷

The primary limitation of the residual methodology is that neither the total foreign-born population nor the legal foreign-born population is known with perfect precision, yielding a degree of uncertainty about the resulting residual estimate. The total foreign-born population cannot be estimated precisely because the Census data are subject to sampling and coverage error and because of uncertainty about the degree to which the foreign born are undercounted in the Census data.⁵⁸ DHS counts 100 percent of legal admissions and so has more precise information about legal inflows in any given year, but these data do not yield a precise count of the legal foreign-born population because of uncertainty about deaths and emigration. Nongovernmental estimates of the legal immigrant population have an added degree of uncertainty because they rely on more limited data on legal inflows. These limitations mean that estimates of the unauthorized population generated by the residual method have a margin of error, but estimates should be reliable over time.

b) Potential Improvements

Given that the residual methodology is well established, the main opportunities to improve on existing estimates of the unauthorized population involve developing faster and more reliable data on the legal foreign-born population for use within the existing approach. For example, rather than (or in addition to) estimating the legal immigrant population indirectly from DHS admissions data, the Census Bureau (or DHS) could measure this population directly by including questions about legal status in a

55 Bryan Baker and Nancy Rytina, *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012* (Washington, DC: DHS, Office of Immigration Statistics, 2013), www.dhs.gov/sites/default/files/publications/ois_ill_pe_2012_2.pdf; Pew Research Center, *Unauthorized Immigrant Totals Rise in 7 States, Fall in 4: Decline in Those From Mexico Fuels Most State Decreases* (Washington, DC: Pew Research Center, 2014), www.pewhispanic.org/files/2014/11/2014-11-18_unauthorized-immigration.pdf; Robert Warren, "Democratizing Data about Unauthorized Residents in the United States: Estimates and Public-Use Data, 2010 to 2013," *Journal on Migration and Human Security*, vol. 2, no. 4 (2014): 305-328, <http://jmhs.cmsny.org/index.php/jmhs/article/view/38>.

56 Ibid.

57 MPI Data Hub, "Unauthorized Immigrant Population Profiles," accessed January 18, 2016, www.migrationpolicy.org/programs/us-immigration-policy-program-data-hub/unauthorized-immigrant-population-profiles; Pew Research Center, *Unauthorized Immigrant Totals Rise in 7 States, Fall in 4*; Warren, "Democratizing Data about Unauthorized Residents in the United States."

58 Eric B. Jensen, Renuka Bhaskar, and Melissa Scopilliti, "Demographic Analysis 2010: Estimates of Coverage of the Foreign-Born Population in the American Community Survey" (Working Paper no. 103, U.S. Census Bureau, Population Division, June 2015), www.census.gov/content/dam/Census/library/working-papers/2015/demo/POP-twp0103.pdf; Enrico A. Marcelli and Paul M. Ong, "2000 Census Coverage of Foreign-Born Mexicans in Los Angeles County: Implications for Demographic Analysis" (paper presented at the 2002 annual meeting of the Population Association of America, Atlanta, GA, May 2002).



new national survey or by adding a question about status to the ACS or CPS.⁵⁹ Indeed, the Census Bureau already asks questions about legal immigration status as part of a smaller (but still nationally representative) survey, the Survey of Income and Program Participation (SIPP).

More regular updates by DHS to its report on the unauthorized population also would enhance confidence in existing estimates.⁶⁰ And better data on all three unauthorized entry streams (between and at ports of entry, and overstays), when available, also could be used to inform or corroborate residual-based estimates of the unauthorized population.

IV. Conclusion: Setting a Research Agenda

For decades, public doubts and sharp rhetoric about the scope of illegal immigration and the size of the U.S. unauthorized population have been largely unchallenged by hard evidence. In the absence of timely, reliable, and trusted indicators of border security and immigration control, fundamental questions about these issues go unanswered, leaving Congress and the American public unable to resolve longstanding immigration policy disputes or make informed policy choices.

One overarching goal for DHS should be far greater transparency regarding ongoing research, as long as data can be released without compromising enforcement actions.

While data about the unauthorized population will always be characterized by a degree of uncertainty, researchers in and out of government have well-established and reliable methodologies for describing the stock of existing unauthorized immigrants. Less progress has been made when it comes to measuring illegal inflows and visa overstays, but here, too, a number of promising methodologies exist and much is known, or can be known, about trends in illegal immigration flows.

What should the top priorities be going forward? One overarching goal for DHS should be far greater transparency regarding ongoing research, as long as data can be released without compromising enforcement actions. Greater transparency would enable nongovernmental researchers to validate and contribute to existing research methods. The department should produce and release timely and reliable metrics of all four indicators discussed throughout this report: illegal flows between and through ports of entry, visa overstays, and the size of the unauthorized population. In general, the primary hurdles to estimating unauthorized stock and illegal entries between ports are methodological. Estimating unauthorized inflows through ports of entry and overstays, on the other hand, is methodologically straightforward; the main challenge is committing more resources, and possibly relying more extensively on biometric technology.

59 One way to add questions about status to the ACS or the Current Population Survey (CPS) without discouraging participation as well as to promote accurate responses would be to use the so-called “three-card method,” in which the sample is divided into thirds and each subsample includes a different set of questions about immigration status. This method allows researchers to estimate the share of the overall sample that is unauthorized without directly offering “unauthorized” as a survey response category. For a fuller discussion, see Judith A. Droitcour, Eric M. Larson, and Fritz J. Scheuren, “The Three Card Method: Estimating Sensitive Survey Items—With Permanent Anonymity of Response” (Proceedings of the Annual Joint Statistical Meetings of the American Statistical Association, Atlanta, GA, August 5-9, 2001), www.amstat.org/sections/srms/proceedings/y2001/proceed/00582.pdf.

60 The most recent DHS report on the size of the unauthorized population uses data as of January 2012; Baker and Rytina, *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012*.



Measuring the unauthorized stock. The methodological challenge here is how to produce faster and more reliable estimates of the total and legal foreign-born populations, permitting residual analysis of the unauthorized stock. The most direct way to address this challenge is for government and/or nongovernment research agencies to design surveys more directly to collect these data, and to make them available more quickly to immigration researchers. In the absence of a nationally representative survey that measures legal status, DHS should also more regularly publish its estimates of the legal foreign-born population and/or make legal inflow data more readily available to nongovernmental researchers.

Illegal flows between ports of entry. Estimating these flows, which represent the most politically contentious measure of immigration control, pose the greatest measurement challenges, as there will always be uncertainty about successful illegal entries. Nonetheless, much more can be done than simply reporting on apprehensions, which remains the single publicly released official indicator of illegal inflows. As described earlier, three distinct methodologies exist to estimate CBP's apprehension rate (or its overall enforcement success rate) and to more accurately describe illegal inflows: model-based recidivism analysis, survey data, and observational data. None of these methodologies offer a complete strategy for estimating inflows, but each relies on different types of primary data, meaning DHS can and should pursue an all-of-the-above approach. The results of each part of the three-pronged analysis may be used to refine and validate the others, and taken together these three methods can produce a reliable range of estimates.

Unauthorized inflows through ports of entry. Here, the research challenge is less complex. The known flow of people through the ports defines the population to be studied. So it is relatively straightforward to design a sampling frame that would allow for accurate estimates of illegal inflows. In this case, the challenge is simply to expand the existing COMPEX program to cover all types of inflows (including pedestrian and commercial traffic) and to ensure that secondary inspections are designed to detect identity fraud—for example, by collecting biometrics. For the program to produce accurate estimates, the sampling frame must be large enough to measure rare events, and sampling must be unpredictable (and sustained during busy flow periods) to ensure that unauthorized immigrants cannot anticipate and avoid the program.

Overstays. DHS faces two distinct challenges when it comes to estimating visa overstayers. In the short run, DHS must develop a better data management system to successfully match the exit data currently collected against entries and changes in nonimmigrants' visa statuses to distinguish among people who have left the country in accordance with their visa terms, people who have lawfully extended their stays, and visa overstayers. With publication of its January 2016 visa overstay report, DHS has demonstrated its ability to identify overstayers among temporary visitors for business and pleasure; the next step will involve extending this analysis to cover other types of nonimmigrant visas.

Setting aside this challenge, existing entry-exit data confront a gaping hole at the Southwest border, leaving a potentially large number of Mexican and Central American overstayers totally unmonitored. So the most important medium- to long-term challenge is to begin collecting data from southbound travelers at the U.S.-Mexico border. Conducting southbound screening would have the added benefit—indeed, arguably the primary benefit—of strengthening efforts to combat illegal southbound flows of currency, firearms, and other contraband. The primary obstacle to collecting exit data at the U.S.-Mexico border is the lack of infrastructure. Several Southwest border ports are in dense urban environments that would be especially difficult to retrofit to allow for exit data collection without creating much longer wait times for existing traffic flows.⁶¹

Three main options exist for Southwest border data collection. First, DHS could expand on existing “pulse and surge” operations that it already conducts to combat illegal southbound flows of currency, firearms, and other contraband. In the course of these law enforcement efforts, CBP could also collect exit data

61 Better scan-in-motion technology to allow DHS to more quickly capture data from exiting travelers without delaying their travel through a port could alleviate these problems; preliminary tests of remote document scanning visa RFID technology have thus far proven unsuccessful; see GAO, *Border Security: US-VISIT Program Faces Strategic, Operational, and Technological Challenges at Land Ports of Entry*, GAO-07-378T (Washington, DC: GAO, 2007), www.gao.gov/products/GAO-07-248. In December 2015, DHS announced plans to test an exit-data pilot program based on iris scan technology; it remains to be seen how this system affects traffic flow, particular for the vast majority of southbound flows in cars and other vehicles.



from travelers departing the country. Second, depending on the outcomes of the 2016 Otay Mesa pilot program, DHS may determine that cost-effective technologies exist to scale up biometric data collection for a large volume of exiting travelers without creating unacceptable travel delays. These two options are both actively under consideration, as discussed in the DHS overstay report.⁶² In the long run, the most feasible strategy for Southwest border exit data collection may be a third option not discussed in the DHS report: a U.S.-Mexican information-sharing program similar to the U.S.-Canadian model, a possibility the two countries reportedly have also begun to explore.⁶³ In contrast with the U.S.-Canada border and with air and sea ports, standing up an information-sharing system on the Southwest border would still be costly (in terms of infrastructure and travel time) because Mexico currently collects entry data only from a sample of southbound travelers. Even so, it may prove more efficient to build on existing infrastructure at Mexican entry points than to construct new U.S. exit infrastructure from scratch.

Regardless of how data are collected, a southbound screening program may need to focus, at least initially, on a random sample of travelers. By counting the number of nonimmigrants departing on time in a small sample of southbound border crossers, DHS could estimate the share of all nonimmigrants leaving the country this way, along with an estimate of the number of visa overstayers. CBP has already completed a study of U.S.-Mexico border traffic patterns that it will use to guide its placement of exit data resources;⁶⁴ this traffic study likely includes the information needed to construct an exit data sampling frame.

An additional set of questions about exit data collection is whether DHS should prioritize the collection of biometric exit data (as required by existing law and as envisioned in current pilot programs) rather than relying on document-based biographic data. To the extent that the goal of the entry-exit system is to estimate the number of visa overstayers, the added infrastructure and personnel costs and privacy concerns involved in a biometric system cannot be justified. In general, while a biographic exit data system may make mistakes when it comes to the actual identity of exiting passengers (i.e., because it permits someone to exit under a false name), a biographic system should be highly accurate when it comes to counting the total number of departing travelers, which is the key question for comparing inflow and outflow numbers.

The potential advantage of biometric data collection is that it yields more accurate information about who is traveling. Yet while accurate identity information may prevent a person who is a known national-security or public-safety threat from leaving the country, the concrete benefits of biometric exit screening would be limited because any temporary nonimmigrant who is known to represent a security threat would be identified prior to *entering* the United States. Adding exit screening offers little value. Moreover, the possibility that a known security threat will secretly leave the United States generally *strengthens* U.S. security by moving the threat farther away.

An additional set of questions about exit data collection is whether DHS should prioritize the collection of biometric exit data.

These observations relate to three more general conclusions. First, sampling should be at the heart of DHS data collection efforts when it comes to border metrics. A well-constructed random sample could be used to develop reliable estimates of nonimmigrant outflows and of visa overstayers at a fraction of the cost of a universal screening program. Sampling is already central to the COMPEX system (though it remains unclear whether the COMPEX sample is well-designed). And sampling could also substantially lower the cost of border surveillance for the purposes of measuring illicit crossings and developing bor-

⁶² DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*, p. 4.

⁶³ CBP, *Comprehensive Exit Plan: Fiscal Year 2013 Report to Congress* (Washington, DC: CBP, 2013), [http://cis.org/sites/cis.org/files/CBP%20-%20Comprehensive%20Exit%20Plan%20\(1\).pdf](http://cis.org/sites/cis.org/files/CBP%20-%20Comprehensive%20Exit%20Plan%20(1).pdf).

⁶⁴ DHS, *Entry/Exit Overstay Report, Fiscal Year 2015*, p. 4.



der metrics.⁶⁵

Second, DHS should work with external partners on border metrics. In addition to partnering with the governments of Mexico and Canada and air and sea carriers on data collection, important opportunities exist to work with partners at universities and think tanks on the design and collection of survey data and on model-based analyses of illegal flows (e.g., through further refinements to recidivism analysis) and stocks (through further refinements to the residual model).

Finally, the future of reliable border metrics depends on DHS producing and releasing border-related data in a far more transparent, timely, and predictable manner. Indeed, regardless of any other actions DHS may take to strengthen its border analytics, it is only through the regular and open publication of its underlying border data than DHS can build credibility and win the trust and confidence of Congress and the American people.

For more on MPI's U.S. Immigration Policy Program, please visit:
**[www.migrationpolicy.org/programs/
us-immigration-policy-program](http://www.migrationpolicy.org/programs/us-immigration-policy-program)**

⁶⁵ Surveillance of a statistically representative sample of the border could produce an accurate count of illegal inflows; additional surveillance in high-flow areas may also be necessary for enforcement purposes.



Works Cited

- Baker, Bryan and Nancy Rytina. 2013. *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2012*. Washington, DC: Department of Homeland Security, Office of Immigration Statistics. www.dhs.gov/sites/default/files/publications/ois_ill_pe_2012_2.pdf.
- Canada Border Services Agency (CBSA) and U.S. Department of Homeland Security (DHS). N.d. *Entry/Exit Information System Phase I Joint Canada-United States Report*. Ottawa and Washington, DC: CBSA and DHS. www.cbp.gov/sites/default/files/documents/canada_usreport_3.pdf.
- Center for Comparative Immigration Studies, University of California San Diego. N.d. Mexican Migration Field Research and Training Program. Accessed January 15, 2016. <http://socialsciences.ucsd.edu/resources/students/opportunities/mexican-migration.html>.
- Cornelius, Wayne, Micah Gell-Redman, Hillary S. Kosnac, Pedro Lewin-Fischer, and Veronica Noriega, eds. 2015. *The New Face of Mexican Migration: A Transnational Community in Yucatán and California*. La Jolla, CA: University of California San Diego, Center for Comparative Immigration Studies.
- Dibble, Sandra. 2015. Otay Mesa border crossing launches testing of facial recognition technology. *Los Angeles Times*, December 3, 2015. www.latimes.com/local/california/la-me-1213-border-biometrics-20151213-story.html.
- Droitcour, Judith A., Eric M. Larson, and Fritz J. Scheuren. 2001. *The Three Card Method: Estimating Sensitive Survey Items—With Permanent Anonymity of Response*. Proceedings of the Annual Joint Statistical Meetings of the American Statistical Association, Atlanta, GA, August 5-9, 2001. www.amstat.org/sections/srms/proceedings/y2001/proceed/00582.pdf.
- El Colegio de la Frontera Norte (COLEF). N.d. Encuesta sobre Migración en la Frontera Norte de México. Accessed January 15, 2016. www.colef.mx/emif/.
- Espenshade, Thomas J. 1995. Using INS Border Apprehension Data to Measure the Flow of Undocumented Migrants Crossing the U.S.-Mexico Frontier. *International Migration Review* 29 (2): 545-65.
- Government Accountability Office (GAO). 2007. *Border Security: US-VISIT Program Faces Strategic, Operational, and Technological Challenges at Land Ports of Entry*. Washington, DC: GAO. www.gao.gov/products/GAO-07-248.
- . 2012. *Key Elements of New Strategic Plan Not Yet in Place to Inform Border Security Status and Resource Needs*. Washington, DC: GAO. www.gao.gov/assets/660/650730.pdf.
- . 2013. *Overstay Enforcement: Additional Actions Needed to Assess DHS's Data and Improve Planning for a Biometric Air Exit Program*. Washington, DC: GAO. www.gao.gov/assets/660/656316.pdf.
- Grimes, Mark, Elyse Golob, Alexandra Durcikova, and Jay Nunamaker. 2013. *Reasons and Resolve to Cross the Line: A Post-Apprehension Survey of Unauthorized Immigrants along the U.S.-Mexico Border*. Tucson: University of Arizona, National Center for Border Security and Immigration. www.borders.arizona.edu/cms/sites/default/files/Post-Apprehension-Survey-REPORT%20may31-2013_0.pdf.
- Heyman, David F., John Wagner, and John Woods. 2013. Testimony of U.S. Customs and Border Protection and U.S. Immigration and Customs Enforcement before the House Committee on Homeland Security, Subcommittee on Border and Maritime Security. *Fulfilling a Key 9/11 Commission Recommendation: Implement-*



ing Biometric Exit. 113th Cong., 1st sess., September 25, 2013. <http://docs.house.gov/meetings/HM/HM11/20130926/101264/HHRG-113-HM11-Wstate-WagnerJ-20130926.pdf>.

Illegal Immigration Reform and Immigrant Responsibility Act of 1996. Public Law 104–208. 110 Statute 3009-546, §110.

Jensen, Eric B., Renuka Bhaskar, and Melissa Scopilliti. 2015. *Demographic Analysis 2010: Estimates of Coverage of the Foreign-Born Population in the American Community Survey.* Working paper no. 103, U.S. Census Bureau, Population Division, Washington, DC. www.census.gov/content/dam/Census/library/working-papers/2015/demo/POP-twps0103.pdf.

Kelley, Colleen M. 2009. Testimony of President, National Treasury Employees Union, before House Committee on Homeland Security, Subcommittee on Border and Maritime Security. *Cargo Security Threats at Land Ports of Entry.* 111th Cong., 1st sess., October 22, 2009. www.gpo.gov/fdsys/pkg/CHRG-111hrg57596/html/CHRG-111hrg57596.htm.

Marcelli, Enrico A. and Paul M. Ong. 2002. *2000 Census Coverage of Foreign-Born Mexicans in Los Angeles County: Implications for Demographic Analysis.* Paper presented at the 2002 annual meeting of the Population Association of America, Atlanta, GA, May 2002.

Meissner, Doris, Donald M. Kerwin, Muzaffar Chishti and Claire Bergeron. 2013. *Immigration Enforcement in the United States: The Rise of a Formidable Machinery.* Washington, DC: Migration Policy Institute. [www.migrationpolicy.org/research/immigration-enforcement-united-states-rise-formidable-machinery](http://migrationpolicy.org/research/immigration-enforcement-united-states-rise-formidable-machinery).

Mexican Migration Project (MMP). N.d. Study Design. Accessed December 29, 2015. <http://mmp.opr.princeton.edu/research/studydesign-en.aspx>.

———. N.d. What's the MMP? Accessed January 15, 2016. <http://mmp.opr.princeton.edu/>.

Migration Policy Institute (MPI) Data Hub. N.d. Unauthorized Immigrant Population Profiles. Accessed January 15, 2016. www.migrationpolicy.org/programs/us-immigration-policy-program-data-hub/unauthorized-immigrant-population-profiles.

———. N.d. Profile of the Unauthorized Population: United States. Accessed January 14, 2016. www.migrationpolicy.org/data/unauthorized-immigrant-population/state/US.

Morral, Andrew R., Henry H. Willis, and Peter Brownell. 2011. *Measuring Illegal Border Crossing Between Ports of Entry: An Assessment of Four Promising Methods.* Santa Monica, CA: RAND Homeland Security and Defense Center. www.rand.org/pubs/occasional_papers/OP328.html.

National Research Council. 2013. *Options for Estimating Illegal Entries at the U.S.-Mexico Border.* Washington, DC: The National Academies Press. www.nap.edu/catalog/13498/estimating-illegal-entries-at-the-us-mexico-border.

Passel, Jeffrey S. and D'Vera Cohn. 2015. Unauthorized immigrant population stable for half a decade. Pew Research Center, Fact Tank, July 22, 2015. www.pewresearch.org/fact-tank/2015/07/22/unauthorized-immigrant-population-stable-for-half-a-decade/.

Pew Hispanic Center. 2006. Modes of Entry for the Unauthorized Migrant Population. Fact sheet, Pew Hispanic Center, Washington, DC, October 2011. www.pewhispanic.org/files/2011/10/19.pdf.

Pew Research Center. 2014. *Unauthorized Immigrant Totals Rise in 7 States, Fall in 4: Decline in Those From Mexico Fuels Most State Decreases.* Washington, DC: Pew Research Center. www.pewhispanic.org/files/2014/11/2014-11-18_unauthorized-immigration.pdf.



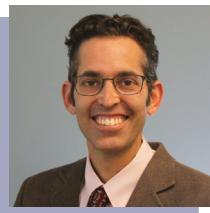
- Roberts, Bryan. 2015. *Measuring the Metrics: Grading the Government on Immigration Enforcement*. Washington, DC: Bipartisan Policy Center. http://bipartisanpolicy.org/wp-content/uploads/2015/02/BPC_Immigration_MeasuringEnforcement.pdf.
- Roberts, Bryan, Edward Alden, and John Whitley. 2013. *Managing Illegal Immigration to the United States: How Effective Is Enforcement?* Washington, DC: Council on Foreign Relations. www.cfr.org/immigration/managing-illegal-immigration-united-states/p30658.
- Rosenblum, Marc R. and Doris Meissner with Claire Bergeron and Faye Hipsman. 2014. *The Deportation Dilemma: Reconciling Tough and Humane Enforcement*. Washington, DC: Migration Policy Institute. www.migrationpolicy.org/research/deportation-dilemma-reconciling-tough-humane-enforcement.
- Seghetti, Lisa. 2014. *Border Security: Immigration Enforcement Between Ports of Entry*, R12438. Washington, DC: Congressional Research Service. www.fas.org/sgp/crs/homesec/R42138.pdf.
- . 2015. *Border Security: Immigration Inspections at Ports of Entry*. Washington, DC: Congressional Research Service. www.fas.org/sgp/crs/homesec/R43356.pdf.
- U.S. Census Bureau. N.d. American Community Survey. Accessed January 18, 2016. www.census.gov/history/www/programs/demographic/american_community_survey.html.
- U.S. Committee for Refugees and Immigrants (USCRI) and Universidad Tecnologica de El Salvador (UTEC). 2013. *A Profile of the Modern Salvadoran Migrant*. Washington, DC: USCRI and UTEC. <http://refugees.org/wp-content/uploads/2015/12/A-Profile-of-the-Modern-Salvadorean-Migrant-English.pdf>.
- U.S. Customs and Border Protection (CBP). 2013. *Comprehensive Exit Plan: Fiscal Year 2013 Report to Congress*. Washington, DC: CBP. [http://cis.org/sites/cis.org/files/CBP%20-%20Comprehensive%20Exit%20Plan%20\(1\).pdf](http://cis.org/sites/cis.org/files/CBP%20-%20Comprehensive%20Exit%20Plan%20(1).pdf).
- . 2014. CBP Fiscal Year 2013 in Review. CBP, Washington, DC, January 17, 2014. www.cbp.gov/newsroom/local-media-release/2014-01-17-000000/cbp-fiscal-year-2013-review.
- . N.d. Arrival/Departure Forms: I-94 and I-94W. Accessed January 15, 2016. www.cbp.gov/travel/international-visitors/i-94-instructions.
- . N.d. On a Typical Day in Fiscal Year 2014, CBP.... Accessed January 15, 2016. www.cbp.gov/newsroom/stats/typical-day-fy2014.
- U.S. Department of Homeland Security (DHS). 2014. *Budget-in-Brief: Fiscal Year 2015*. Washington, DC: DHS. www.dhs.gov/sites/default/files/publications/FY15BIB.pdf.
- . 2015. *2014 Beyond the Border Implementation Report to Leaders*. Washington, DC: DHS. www.dhs.gov/sites/default/files/publications/15_0320_15-0745_BTB_Implementation_Report.pdf.
- . 2015. DHS Releases End of Fiscal Year 2015 Statistics. News release, December 22, 2015. www.dhs.gov/news/2015/12/22/dhs-releases-end-fiscal-year-2015-statistics.



- . 2016. *Entry/Exit Overstay Report, Fiscal Year 2015*. Washington, DC: DHS. www.dhs.gov/publication/entryexit-overstay-report.
- . *Illegal Alien Resident Population*. Accessed January 15, 2016. www.dhs.gov/xlibrary/assets/statistics/il-legal.pdf.
- U.S. Department of Homeland Security, Office of Immigration Statistics (OIS). 2010. *An Analysis of Migrant Smuggling Costs Along the Southwest Border*. Washington, DC: DHS, OIS. www.dhs.gov/xlibrary/assets/statistics/publications/ois-smuggling-wp.pdf.
- Vaughan, Jessica. 2016. DHS Reports Huge Number of Visitors Overstayed in 2015. Blog posting, Center for Immigration Studies, January 20, 2016. <http://cis.org/vaughan/dhs-reports-huge-number-visitors-overstayed-2015>.
- Warren, Robert. 1994. *Estimates of the unauthorized immigrant population residing in the United States, by country of origin and state of residence: October 1992*. Unpublished paper presented at the annual meeting of the Population Association of America, Miami, Florida, May 5-7, 1994. www.popline.org/node/289723.
- . 2014. Democratizing Data about Unauthorized Residents in the United States: Estimates and Public-Use Data, 2010 to 2013. *Journal on Migration and Human Security* 2 (4): 305-28. <http://jmhs.cmsny.org/index.php/jmhs/article/view/38>.
- Warren, Robert and John Robert Warren. 2013. *A Review of the Declining Numbers of Visa Overstays in the U.S. from 2000 to 2009*. New York: Center for Migration Studies of New York. <http://cmsny.org/wp-content/uploads/Warren-Blog-on-Overstays-4.1.13.pdf>.
- . 2013. Unauthorized Immigration to the United States, Annual Estimates and Components of Change, by State, 1990 to 2010. *International Migration Review* 47 (2): 296–329. <http://onlinelibrary.wiley.com/doi/10.1111/imre.12022/epdf>.
- Wasem, Ruth Ellen. 2012. *Unauthorized Aliens Residing in the United States: Estimates Since 1986*. Washington, DC: Congressional Research Service. www.fas.org/sgp/crs/misc/RL33874.pdf.
- Zenko, Micah. 2015. *Red Team: How to Succeed By Thinking Like the Enemy*. New York: Basic Books.



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