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Report to Congressional Committees

March 2019

BORDER SECURITY

DHS Should Improve the Quality of Unlawful Border Entry Information and Other Metric Reporting

Accessible Version

GAO-19-305

GAO Highlights

Highlights of GAO-19-305, a report to congressional committees

March 2019

BORDER SECURITY

DHS Should Improve the Quality of Unlawful Border Entry Information and Other Metric Reporting

Why GAO Did This Study

According to DHS, the United States has approximately 6,000 miles of land borders, 95,000 miles of coastline, and more than 300 ports of entry where travelers and cargo are inspected and processed for entry. Securing U.S. border areas is a key part of DHS's mission, and the department's ability to measure its border security efforts is essential for it to manage its responsibilities effectively and efficiently.

The NDAA for Fiscal Year 2017 requires DHS to report annually on 43 border security metrics. DHS issued its first report in May 2018. The Act also includes a provision for GAO, within 270 days of receipt and biennially for the following 10 years, to review and report on the data and methodology contained in DHS's report. This report assesses the extent to which DHS: (1) reported metrics as outlined in the NDAA using quality information; and (2) validated assumptions and conveyed statistical uncertainty for unlawful entry metrics, among other objectives. GAO assessed the methodology and data in DHS's report, analyzed DHS's use of statistical models, and interviewed officials from DHS offices and components involved in developing the metrics.

What GAO Recommends

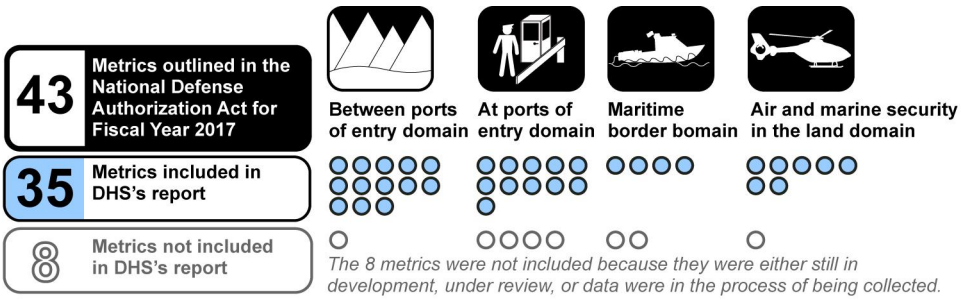
GAO is making four recommendations, including that DHS develop and implement a process to systematically review the reliability of metric data, identify and communicate limitations of the metrics, and include the results of sensitivity analyses and measures of statistical uncertainty for metrics derived from statistical models. DHS concurred with the recommendations.

View GAO-19-305. For more information, contact Rebecca Gambler at (202) 512- 8777 or gamblerr@gao.gov.

What GAO Found

The Department of Homeland Security (DHS) reported on 35 of 43 metrics called for by the National Defense Authorization Act (NDAA) for Fiscal Year 2017 (see figure); it generally used quality information, but did not identify some data limitations. GAO found that about half of the 35 metrics generally included elements as called for by the NDAA, while 17 metrics differed, such as in scope or calculation. For example, DHS only provided information on the southwest border for some metrics, such as the estimate of undetected unlawful border crossers for which a methodology for estimating unlawful crossings for the northern border had not yet been completed. DHS components responsible for collecting the metric data generally have processes in place to ensure the reliability of the data and the quality of the information provided. DHS also identified and disclosed limitations for some, but not all, of the data elements and metrics used. For example, GAO found that DHS did not disclose limitations on data related to apprehensions of individuals that were assisted by unmanned aerial systems. By developing and implementing a process to systematically review the reliability of the data and comprehensively identify and communicate limitations, DHS would improve the quality of the information provided.

Number of Metrics Included in the Department of Homeland Security's (DHS) Fiscal Year 2017 *Border Security Metrics Report*



Source: GAO analysis of DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

DHS used a statistical model to estimate three metrics on unlawful border entries but did not validate some assumptions the model employs through sensitivity analyses and provide measures of statistical uncertainty in accordance with standards for federal agencies. For example, DHS's model assumes that 100 percent of families unlawfully crossing the border will be apprehended, but DHS did not provide information on the extent to which the assumption affected its metrics. DHS also did not provide information on the level of statistical uncertainty for the metrics, such as margins of error. Providing such information would allow Congress and the public to better understand the potential limitations and accuracy of these metrics of unlawful entry. Additionally, DHS's statistical model, which is based on Mexican adults not seeking asylum, represents a small and declining share of those apprehended at the border and DHS is developing a new model to account for current border conditions.

Contents

Letter 1

Background 5
DHS Reported Information on Most Required Metrics and Generally Used Quality Information but Did Not Identify Some Limitations 8
DHS's Model to Estimate Unlawful Border Entries Uses Assumptions that Have Not Been Validated and Does Not Convey Uncertainty of Estimates 20
Our Prior Work Has Identified Other Metrics DHS Could Use to Help Measure the Effectiveness of Border Security 32
Conclusions 36
Recommendations for Executive Action 37
Agency Comments 38

Appendix I: Additional Information on Metrics Contained in the Department of Homeland Security's Fiscal Year 2017 *Border Security Metrics Report* 40

Appendix II: Other Metrics the Department of Homeland Security Could Use to Measure the Effectiveness of Border Security 97

Appendix III: Comments from the Department of Homeland Security 104

Appendix IV: GAO Contact and Staff Acknowledgments 108

Appendix V: Accessible Data 109

Data Tables 109
Agency Comment Letter 110

Tables

Table 1: Examples of Border Security Metrics by Domain and Department of Homeland Security (DHS) Component 6
Table 2: Examples of Information the Department of Homeland Security (DHS) Provided in Its Fiscal Year 2017 *Border Security Metrics Report* Relative to Elements in the

National Defense Authorization Act for Fiscal Year 2017 (NDAA) 10
Table 3: Metrics on which the Department of Homeland Security (DHS) Did Not Provide Information in Its Fiscal Year 2017 *Border Security Metrics Report* 12
Table 4: Status of Metrics in the Between Ports Of Entry Domain in the Department of Homeland Security's (DHS) Fiscal Year 2017 *Border Security Metrics Report* 42
Table 5: Status of Metrics for Securing the Border at Ports of Entry in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report 44
Table 6: Status of Metrics for Securing the Maritime Border in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report 45
Table 7: Status of Air and Marine Security Metrics in the Land Domain in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report 46
Table 8: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security Between Ports of Entry 98
Table 9: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security At Ports of Entry 99
Table 10: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security in the Maritime Border Domain 101
Table 11: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Air and Marine Border Security in the Land Domain 103

Figures

Figure 1: Number and Type of Metrics Included in the Department of Homeland Security's (DHS) Fiscal Year 2017 *Border Security Metrics Report* 9
Figure 2: Framework for Department of Homeland Security's (DHS) Model-based Apprehension Rate 23
Figure 3: Apprehensions Reflected in the Department of Homeland Security's Statistical Analysis to Estimate Undetected Unlawful Entries 29

Figure 4: Individuals Apprehended at the Border Who Are Not Included in the Department of Homeland Security's (DHS) Model-based Apprehension Rate 30
Accessible Data for Figure 3: Apprehensions Reflected in the Department of Homeland Security's Statistical Analysis to Estimate Undetected Unlawful Entries 109
Accessible Data for Figure 4: Individuals Apprehended at the Border Who Are Not Included in the Department of Homeland Security's (DHS) Model-based Apprehension Rate 109

Abbreviations

AMO	Air and Marine Operations
APR	Annual Performance Report
Border Patrol	U.S. Border Patrol
CBP	U.S. Customs and Border Protection
CDS	Consequence Delivery System
Coast Guard	U.S. Coast Guard
COMPEX	Compliance Measurement Examination
DHS	Department of Homeland Security
ERO	Enforcement and Removal Operations
GPRAMA	Government Performance and Results Act Modernization Act of 2010
ICE	U.S. Immigration and Customs Enforcement
ISF	Importer Security Filing
NDAA	National Defense Authorization Act for Fiscal Year 2017
NTC	National Targeting Center
OFO	Office of Field Operations
OIG	Office of Inspector General
OIS	Office of Immigration Statistics
OMB	Office of Management and Budget
POE	port of entry
UAC	unaccompanied alien children
VADER	Vehicle and Dismount Exploitation Radar

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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March 21, 2019

The Honorable Ron Johnson
Chairman
The Honorable Gary Peters
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Bennie G. Thompson
Chairman
The Honorable Mike Rogers
Ranking Member
Committee on Homeland Security
House of Representatives

Securing the nation's borders against illegal entries, smuggling of drugs and contraband, and terrorist activities is a key part of the Department of Homeland Security's (DHS) mission. According to DHS, the United States has approximately 6,000 miles of land borders, 95,000 miles of coastline, and 328 ports of entry (POE).[1] DHS's ability to measure border security activities, outputs, and outcomes is essential for the department to make evidence-based decisions about resource allocation and investments and manage its border security responsibilities effectively and efficiently. In

[1]POEs are facilities that provide for the controlled entry into or departure from the United States. Specifically, a POE is any officially designated location (seaport, airport, or land border location) where DHS officers or employees are assigned to clear passengers and merchandise, collect duties, and enforce customs laws, and where DHS officers inspect persons entering or applying for admission into, or departing the United States pursuant to U.S. immigration and travel controls.

our prior work, we have reported on the need for DHS to improve its measures for assessing its border security efforts.[2]

The National Defense Authorization Act for Fiscal Year 2017 (NDAA) requires DHS to provide an annual report to appropriate congressional committees, the Comptroller General, and certain other entities, containing 43 specific metrics to measure the effectiveness of border security in four domains—between POEs, at POEs, the maritime border, and with respect to aviation assets and other air and marine operations in the land domain.[3] The majority of the 43 metrics are counts and rates of border security activities, such as the number of detected unlawful entries between POEs and a rate that measures traffic volume at land POEs against the physical and staffing capacity at each land POE. The remaining metrics are estimates, such as the number of undetected unlawful entries, or were not specifically described. DHS issued its first report to respond to the NDAA requirement in May 2018, titled *Border Security Metrics Report*.[4] The NDAA also includes a provision for us, within 270 days of receipt and biennially for the following 10 years, to review and report to Congress on DHS's report. Specifically, the provision directs us to analyze the suitability and statistical validity of the data and methodology contained in the report, and, as appropriate, include recommendations on improvements needed to the metrics and the feasibility of other suitable metrics. This report addresses the following questions:

[2]For example, in February 2017 we reported on the use of border fencing along the southwest border and found that DHS could do more to measure the impact of its fencing on border security operations. We recommended that DHS develop metrics to assess the contributions of pedestrian and vehicle fencing to border security along the southwest border using existing data. DHS agreed, and as of October 2018, stated that the department planned to implement such metrics by September 2019. See GAO, *Southwest Border Security: Additional Actions Needed to Better Assess Fencing's Contributions to Operations and Provide Guidance for Identifying Capability Gaps,* GAO-17-331 (Washington, D.C.: Feb. 16, 2017).

[3]Pub. L. No. 114-328, div. A, tit. X, subtit. G, § 1092(g), 130 Stat. 2000, 2435 (2016) (classified at 6 U.S.C. § 223(g)).

[4]Department of Homeland Security, *Border Security Metrics Report* (Washington, D.C.: May 1, 2018). According to DHS officials, this report is intended to satisfy the NDAA reporting requirement for fiscal year 2017; therefore, we refer to it as DHS's fiscal year 2017 *Border Security Metrics Report*. Any references to future DHS border security metrics reports are according to the fiscal year DHS intends them to satisfy the NDAA's annual reporting requirement.

1. To what extent has DHS reported metrics as outlined in the NDAA using quality information?
2. To what extent has DHS validated the assumptions and conveyed statistical uncertainty for its unlawful entry metrics?
3. What, if any, other metrics have been identified that may be used to measure the effectiveness of border security?

To determine the extent to which DHS reported metrics outlined in the NDAA using quality information, we first determined which of the 43 metrics DHS included in its first annual report and which it did not.[5] For metrics DHS included, we identified the specific data sources and sets DHS used to develop them, such as administrative data collected by DHS components (e.g., data on apprehensions, POE wait times, drug seizures, and flight hours). We also interviewed officials from DHS offices and components involved in developing the metrics, including the Office of Immigration Statistics (OIS), U.S. Customs and Border Protection's (CBP) Office of Field Operations, U.S. Border Patrol (Border Patrol), and Air and Marine Operations (AMO); and the U.S. Coast Guard (Coast Guard). In these interviews we obtained information about the methodologies DHS components used to develop the metrics, including any limitations they identified and their plans to update or revise existing metrics in the future. To determine the extent to which DHS reported metrics as outlined in the NDAA, we assessed how, if at all, the metrics DHS presented and the methods DHS used to calculate the metrics were similar to, or different from, the metrics listed in the NDAA. Where we identified clear differences between the metrics DHS reported and those described in the NDAA, we reviewed documentation and obtained additional perspectives from DHS officials, as necessary, to determine the reasons for the differences.

To determine the quality of the information used for the metrics, we assessed the extent to which DHS has processes to ensure data reliability and quality. Specifically, we reviewed any of our ongoing or

[5]In its fiscal year 2017 *Border Security Metrics Report*, DHS also provided information and data on selected characteristics of recent apprehensions, at-the-border deterrence, and border crossing costs. This additional information was provided to respond to a separate NDAA requirement for DHS to issue a "State of the Border" report in which DHS was to include trends and analyses related to border security metrics, and "any other information that the Secretary determines appropriate." See 6 U.S.C. § 223(g)(3). Because this additional information was outside of the scope of the *Border Security Metrics Report* as specified in the NDAA, we did not include this additional information as part of our analysis.

completed work relevant to the metrics, relevant DHS Office of Inspector General (OIG) reports, and the metrics included in DHS's Annual Performance Reports to determine which data we had previously assessed or which had been assessed by the OIG or DHS, and the results of those assessments.[6] For data that had not previously been assessed, we collected information from DHS to determine what processes are in place to ensure the overall reliability and quality of the data. We reviewed this information to determine the extent to which DHS's processes are consistent with *Standards for Internal Control in the Federal Government*, good practices for verifying and validating performance information we have identified in our prior work, and DHS's *Management Directive on Information Quality*.[7]

To determine the extent to which DHS validated the assumptions and conveyed statistical uncertainty for its unlawful entry metrics, we first identified the metrics for which DHS utilized a statistical model (i.e., the use of a capture-recapture model to estimate the number of undetected unlawful entries). We interviewed officials from DHS Office of Immigration Statistics (OIS) and the Institute for Defense Analyses, DHS's contractor, to obtain information on the statistical model used to estimate unlawful border entry metrics, including assumptions made and how, if at all, they were validated.[8] We further analyzed DHS's use of the statistical model

[6]DHS, *Annual Performance Report Fiscal Years 2017-2019,* (Washington, D.C.: February 5, 2018).

[7]GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G, (Washington, D.C.: September 2014); GAO, *Performance Plans: Selected Approaches for Verification and Validation of Agency Performance Information*, GGD-99-139 (Washington, D.C.: July, 30, 1999); and Department of Homeland Security, *Management Directive 8200.1: Information Quality*, March 1, 2003. In our July 1999 report, we identified good practices for verifying and validating performance information, such as communicating significant data limitations and their implications, through a review of performance plans, agency documents, and discussions with agency officials at six federal agencies (the departments of Education, Transportation, and Veterans Affairs and the Environmental Protection Agency, the National Science Foundation, and the Office of Personnel Management). The GPRA Modernization Act of 2010 includes instructive provisions for verifying and validating performance information, including communicating limitations to data in the context of the President's annual budget submission to Congress. See 31 U.S.C. §§ 1115(b)(8), 1116(c)(6), 1122(b)(5). Additionally, Office of Management and Budget (OMB) guidance on implementing the Act cites our July 1999 report as a resource for information on performance data verification and validation. See OMB, Circular No. A-11, *Preparation, Submission, and Execution of the Budget,* pt 6 (Washington, D.C.: June 2018).

[8]The Institute for Defense Analyses is a non-profit corporation that operates three federally-funded research and development centers to provide analyses of national security issues, particularly those requiring scientific and technical expertise.

and compared it against practices for the use of statistical models outlined in the Office of Management and Budget's (OMB) *Standards and Guidelines for Statistical Surveys*.[9] Using OMB's standards, we identified principles and practices to determine the extent to which DHS's modeling was consistent with them and what, if any, improvements could be made. We also analyzed DHS's modelling assumptions on the composition of the unlawful migrant population to determine the extent to which assumptions DHS made about the unlawful migrant population reflect data on individuals apprehended between POEs. We interviewed Border Patrol officials and reviewed documentation to obtain information on possible alternative approaches DHS is considering for modelling unobserved events.

To identify other metrics that may be used to measure the effectiveness of border security, we reviewed our prior work and DHS OIG reports related to border security to identify open recommendations focused on establishing border security measures in the four domains listed in the NDAA. We focused our search for prior work on reports that we and the DHS OIG issued from 2010 through 2018.[10]

We conducted this performance audit from May 2018 to March 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The NDAA requires DHS to develop and implement 43 border security metrics in four domains—between POEs, at POEs, the maritime border, and air and marine security in the land environment.[11] Within DHS, CBP

[9]OMB, *Standards and Guidelines for Statistical Surveys* (Washington, D.C.: September 2006).

[10]We selected this time period to include reports that address a range of border security issues and related open recommendations focused on establishing border security measures.

[11]See 6 U.S.C. § 223(b), (c), (d), (e). See appendix I for the metrics required by the NDAA.

and the Coast Guard have primary responsibility for border security within these four domains. CBP and its subcomponents are to secure U.S. borders at and between POEs by preventing inadmissible people and illicit goods from entering the United States, among other responsibilities. Within CBP, the primary offices and components involved in border security are the Office of Field Operations at POEs, Border Patrol between POEs, and Air and Marine Operations for air and marine security in the land and maritime domains.[12] The Coast Guard and CBP's Air and Marine Operations share responsibility for security of the nation's maritime borders. Table 1 shows examples of border security metrics by domain and responsible DHS component.

Table 1: Examples of Border Security Metrics by Domain and Department of Homeland Security (DHS) Component

Domain	Relevant DHS component	Metric
Between ports of entry (POE)	U.S. Customs and Border Protection (CBP) U.S. Border Patrol	The number of apprehensions in each U.S. Border Patrol sector.[a]
At POEs	CBP Office of Field Operations	A secondary examination rate that measures the frequency of secondary examinations at each land POE.[b]
Maritime border	U.S. Coast Guard and CBP	The rate in which illicit drugs are removed by DHS maritime security components.
Air and marine security in the land domain	CBP Air and Marine Operations	The number of missions cancelled by Air and Marine Operations due to weather compared to the total planned missions.

Source: GAO analysis of DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

[a]U.S. Border Patrol divides responsibility for border security operations geographically among 20 sectors, each with its own sector headquarters. Each sector is further divided into varying numbers of stations each with its own area of responsibility. There are nine sectors along the southwest border, eight along the northern border, and three in the Gulf Coast and Caribbean regions.

[b]A secondary examination is when a CBP officer at a POE refers a traveler to a separate area, outside the primary inspection area, to complete the inspection or examination process without causing delays for other travelers. Reasons why a traveler may be referred for a secondary examination include when the CBP officer cannot verify a traveler's information or a traveler does not have all the required documentation, for example.

According to DHS officials, within DHS, two subcomponents within the Office of Strategy, Policy, and Plans were responsible for coordinating the department's effort to develop the fiscal year 2017 *Border Security Metrics Report*. A senior DHS official explained that the report was initially tasked to the Unity of Effort Integration Office, which was part of the Unity

[12]The Office of Field Operations conducts inspections at POEs to prevent the illicit entry of travelers, cargo, merchandise, and other items. Border Patrol is responsible for securing the U.S. border between ports of entry and responding to cross-border threats. Air and Marine Operations is responsible for securing the air and maritime environments at and beyond the border.

of Effort initiative started in 2014 to better understand border security efforts along the southwest border including exploring the development of border security metrics. OIS assumed responsibility for the report in 2017.[13] According to OIS officials, to prepare the report, they obtained data and information related to each NDAA metric from the administrative records of the DHS components with primary responsibilities for border security in the four domains. For example, OIS requested data and information on "turn backs" and "got aways" from Border Patrol—the lead component for the between POE domain—which records sector estimates of turn backs and got aways based on direct and indirect observations.[14]

Of the 43 metrics the NDAA listed for inclusion in the *Border Security Metrics Report*, the majority were counts and rates of border security activities. The remaining metrics were estimates or were not specifically described. For example, the number of apprehensions in each Border Patrol sector is a count metric. In contrast, a rate metric compares one value or number against another. For example, the wait time ratio compares the average wait times to total commercial and private vehicular traffic volumes being processed at a land POE. An estimate is used for metrics of flows or activities that are largely undetected and therefore cannot be measured directly and must be estimated, such as the number of undetected unlawful entries. A few metrics are a combination of counts or rates with an estimate. For example, the metric for total inadmissible travelers at POEs counts known inadmissible travelers that are intercepted at POEs, and also requires an estimate of how many inadmissible travelers may have successfully entered at a POE without being detected, which cannot be directly measured.[15] The

[13]Consistent with the Immigration and Nationality Act, as amended, OIS is the lead office within DHS for the collection and dissemination to Congress and the public of information useful in evaluating the social, economic, environmental, and demographic impact of immigration laws, to include information on the population of aliens in the United States, naturalization rates, and administrative removals, among other statutorily-enumerated information. 8 U.S.C. § 1103(d).

[14]According to the NDAA, the term ''turn back'' means an unlawful border crosser who, after making an unlawful entry into the United States, responds to U.S. enforcement efforts by returning promptly to the country from which such crosser entered. 6 U.S.C. § 223(a)(9). The term ''got away'' means an unlawful border crosser who is directly or indirectly observed making an unlawful entry into the United States, is not apprehended, and is not a turn back. See id. § 223(a)(3).

[15]As defined by the NDAA, this metric combines the number of inadmissible travelers interdicted and the estimated number of inadmissible travelers who successfully enter at a POE without being detected. 6 U.S.C. § 223(c)(1)(A)(i).

NDAA did not specifically describe some metrics. For example, while the NDAA asked for an examination of each of the eight consequences under the Consequence Delivery System, it did not specify how this examination was to be carried out or what it was to include.[16]

While many of the metrics required by the NDAA can be addressed with data from DHS's administrative records, certain metrics that rely on estimates necessitate the use of alternative methodologies and in some cases, specialized technical expertise. For example, DHS contracted with the Institute for Defense Analyses to assist with the development of a statistical model for estimating undetected unlawful entries. In its fiscal year 2017 *Border Security Metrics Report*, DHS provided information on its methodological approaches, such as how it estimated undetected unlawful entries.

DHS Reported Information on Most Required Metrics and Generally Used Quality Information but Did Not Identify Some Limitations

DHS Reported Information on 35 of the 43 Required Metrics and Generally Included Elements Listed in the NDAA

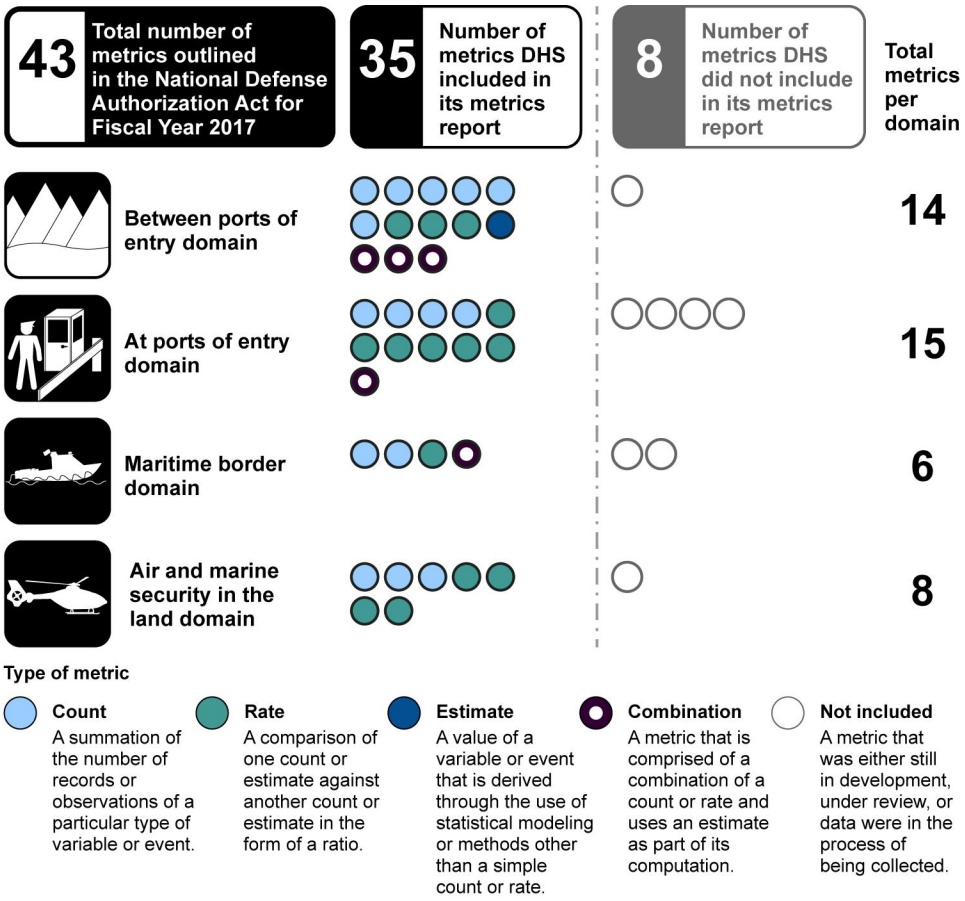
In its first *Border Security Metrics Report*, DHS reported information on 35 of the 43 metrics called for by the NDAA.[17] The metrics DHS provided

[16]6 U.S.C. § 223(b)(1)(I), (J). The Consequence Delivery System refers to the series of consequences applied by Border Patrol in collaboration with other federal agencies to persons unlawfully entering the United States, in order to prevent unlawful border crossing recidivism. Id. at § 223(a)(2).

[17]For the purposes of this report, we refer to the 43 metrics enumerated in the NDAA by the titles provided by DHS in its fiscal year 2017 *Border Security Metrics Report*.

spanned the four domains outlined in the NDAA and included a mix of counts, rates, estimates, or a combination thereof as shown in figure 1.[18]

Figure 1: Number and Type of Metrics Included in the Department of Homeland Security's (DHS) Fiscal Year 2017 *Border Security Metrics Report*



Source: GAO analysis of DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

For 18 of the 35 border security metrics DHS included in its report, we found DHS generally included elements listed in the NDAA. For example,

[18]For the purposes of this report we define the different metric types as follows: count—a summation of the number of records or observations of a particular type of variable or event; rate—a comparison of one count or estimate against another count or estimate in the form of a ratio; estimate—a value of a variable or event that is derived through the use of statistical modeling or methods other than a simple count or rate; and combination—a metric that is comprised of a combination of a count or rate and uses an estimate as part of its computation.

the NDAA asked for the number of detected unlawful entries between POEs, and in its report DHS provided information on the number of detected unlawful entries over a 10-year period.[19] As another example, the NDAA asked for the number of cargo containers at sea ports that were identified to be potentially high-risk.[20] In response, DHS provided information on the number of potentially high-risk containers from fiscal years 2013 through 2016 and also provided contextual information about trends in the volume of such containers over time. See table 2 for more information on these examples as well as other examples of the types of information included in DHS's fiscal year 2017 *Border Security Metrics Report*.

Table 2: Examples of Information the Department of Homeland Security (DHS) Provided in Its Fiscal Year 2017 *Border Security Metrics Report* Relative to Elements in the National Defense Authorization Act for Fiscal Year 2017 (NDAA)

Domain	Metric and related elements described in NDAA	Example of information DHS provided in its *Border Security Metrics Report*
Between ports of entry (POEs)	"Detected unlawful entries": Number of detected unlawful entries between POEs.	DHS reported the number of detected unlawful entries over a 10-year period. These data showed that in fiscal year 2006 there were 2 million detected unlawful entries and in fiscal year 2016 there were just over 600,000, a decrease of 69 percent.
At POEs	Number of potentially "high-risk" cargo containers: A seaport scanning rate that includes the number of all cargo containers that are considered potentially "high-risk" as determined by the Executive Assistant Commissioner of the Office of Field Operations.	DHS reported that cargo shipments are identified as potentially high-risk using National Targeting Center security criteria.[a] According to DHS's report, the number of potentially high-risk containers identified decreased from about 90,000 in fiscal year 2013 to about 72,000 in fiscal year 2016. DHS's report also provided contextual information about the decline, explaining that refinement of the security criteria used in the risk assessment reduced the number of cargo shipments identified as potentially high-risk.
Maritime border	"Known maritime migrant flow rate": Number of undocumented migrants interdicted, identified, directly or indirectly but not interdicted, or otherwise believed to have entered or attempted to enter the United States through the maritime border.	DHS reported known maritime migrant flow in the maritime domain from fiscal years 2007 through 2016, as well as the number of migrants interdicted by U.S. Coast Guard, U.S. Customs and Border Protection, and other DHS partners during the same time period.
Air and marine security in the land domain	"AMO [Air and Marine Operations] individuals detected": Number of individuals detected by U.S. Customs and Border Protection AMO through the use of unmanned aerial systems and manned aircraft.	DHS reported the number of individuals detected by aircraft type for fiscal year 2016: 54,879 for manned aircraft and 7,908 for unmanned aircraft. The report also explained that AMO did not track data from all sensors on aircraft at the time of the report, but the department expects to be able to provide more comprehensive data in its fiscal year 2019 report.

Source: GAO analysis of DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

[19]6 U.S.C.§ 223(b)(1)(A)(ii).

[20]See id.§ 223(c)(1)(G)(i).

[a]The National Targeting Center is a component of U.S. Customs and Border Protection. It uses technology to identify high-risk shipments and travelers that may be connected to terrorism or other transnational crimes, such as narcotics smuggling, human trafficking, merchandise counterfeiting, and money laundering.

For some metrics, DHS also provided information in addition to the elements listed in the NDAA. For example, the NDAA described the "AMO apprehensions assisted" metric as a count of the number of apprehensions that were assisted by CBP's AMO through the use of unmanned aerial systems and manned aircraft.[21] In addition to the counts for such assists, DHS also provided data on the flight hours expended to assist with these apprehensions.

For 17 of the 35 reported metrics, we identified differences between the metric as described by the NDAA and as reported by DHS. The differences we identified generally fell into two categories:[22]

- **Metric differed in scope or calculation.** Some of the metrics DHS reported on differed in scope or in their calculation from what the NDAA described for reasons such as data availability, among other factors. For example, DHS's fiscal year 2017 *Border Security Metrics Report* scoped three metrics on unlawful border crossings between POEs (the "attempted unlawful border crosser apprehension rate," the "estimated undetected unlawful entries," and the "probability of detection rate") to only include data for the southwest border.[23] In these instances, the report noted that a methodology for estimating data on unlawful crossings for the northern border had not yet been completed but that research was underway to do so.[24] As an example of a difference in calculation, DHS presented the interdiction effectiveness rate for each southwest border sector as an alternative to the metric "unlawful border crossing effectiveness rate in each

[21]6 U.S.C. § 223(e)(1)(F).

[22]Metrics may fall into more than one category depending on how many differences we identified between what DHS reported and the elements listed in the NDAA.

[23]6 U.S.C.§ 223(b)(1)(A)(i), (iii), (b)(1)(D).

[24]According to Border Patrol officials, the northern border has different immigration dynamics than the southern border. Officials stated that while the current emphasis of reporting is on the southwest border, efforts are underway to identify and find ways to capture data that are important and reflective of the effectiveness in addressing threats specific to the northern border.

Border Patrol sector."[25] According to DHS's report, the department used the interdiction effectiveness rate because it had not yet produced and validated sector-level estimates of unlawful entries required to calculate the unlawful border crossing effectiveness rate. In its report, DHS stated it expects these estimates to be available for the 2019 report.

- **Alternative metric provided.** For the situational awareness in the maritime environment metric, DHS stated that it is in a multi-year process to develop a metric that meets the intent of the NDAA.[26] As an alternative, DHS instead provided data on the number of aircraft and vessel operational hours that contributed to maritime domain situational awareness.

See appendix I for additional information about any differences we identified for each metric.

The eight metrics on which DHS did not provide information spanned all four domains. In its report, DHS explained that the eight omitted metrics were either still in development, under review within the department, or officials were in the process of collecting data for them. Table 3 lists the eight metrics on which DHS did not provide information and the date DHS estimated it will report on each metric.

Table 3: Metrics on which the Department of Homeland Security (DHS) Did Not Provide Information in Its Fiscal Year 2017 *Border Security Metrics Report*

Domain	Metric DHS did not include in its fiscal year 2017 *Border Security Metrics Report*	Border Security Metrics Report in which DHS estimates reporting on metric[a]
Between ports of entry (POEs)	"A measurement of situational awareness achieved in each U.S. Border Patrol sector"	2020
At POEs	"Unlawful entries at POEs"	2019[b]
At POEs	"Secondary examinations effectiveness rate"	Not specified
At POEs	"Potentially high-risk cargo containers scanned before arrival at a U.S. POE"	Not specified[c]
At POEs	"Potentially high-risk cargo containers scanned upon arrival at a U.S. POE"	Not specified[c]

[25]6 U.S.C. § 223(a)(10), (b)(1)(C). The interdiction effectiveness rate includes known got aways while the unlawful border crossing effectiveness rate includes estimated successful unlawful entries.

[26]Id. at § 223(d)(1)(A).

Domain	Metric DHS did not include in its fiscal year 2017 *Border Security Metrics Report*	Border Security Metrics Report in which DHS estimates reporting on metric[a]
Maritime border	"DHS maritime threat response rate"	2019
Maritime border	"Intergovernmental maritime threat response rate"	2019
Air and marine security metrics in the land domain	"Actionable intelligence"	2019

Source: GAO analysis of DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

[a]References to future DHS border security metric reports are shown according to the fiscal year DHS intends them to satisfy the NDAA's annual reporting requirement.

[b]In its fiscal year 2017 *Border Security Metrics Report* DHS estimated this metric would be reported in its fiscal year 2018 report. According to DHS officials, as of December 2018, they now plan to report on this metric starting in the fiscal year 2019 report.

[c]In its fiscal year 2017 *Border Security Metrics Report* DHS estimated this metric would be reported in its fiscal year 2018 report. According to DHS officials, as of December 2018, this metric will not be included in the fiscal year 2018 report and they did not provide an estimate as to when it will be reported.

DHS Components Generally Have Processes to Help Ensure Reliable Data and Quality Information, but DHS Does Not Have a Systematic Process for Reviewing the Reliability of Data to Identify Limitations

In general, DHS components responsible for collecting the data used in the metrics DHS reported have processes to help ensure the reliability of the data and the quality of the information provided. DHS also identified and disclosed limitations with some of the data elements or methodologies used for the metrics in its report. However, DHS does not have a systematic process for reviewing the reliability of data to identify limitations related to the metrics, and we identified at least one additional limitation for 21 of the 35 metrics on which DHS reported where DHS did not disclose such limitations or could have been more transparent about the limitations or assumptions in its report.

Data are considered reliable when they are reasonably free from error and bias.[27] Quality information is derived from relevant and reliable data and is considered to be, among other things, complete, accurate, and timely.[28] The specific processes DHS components use to ensure data reliability vary from metric to metric. Examples of processes DHS or its

[27]GAO-14-704G.

[28]GAO-14-704G.

components have implemented to help ensure the reliability of the data and the quality of information provided include:

- **Issuing guidance and monitoring implementation.** In September 2012, Border Patrol headquarters officials issued guidance to help provide a more consistent, standardized approach for the collection and reporting of turn back and got away data by Border Patrol sectors. Each sector is individually responsible for monitoring adherence to the guidance. According to DHS's report, command staff at Border Patrol stations ensure agents are aware of and utilize proper definitions for apprehensions, got aways, and turn backs at their respective stations and also ensure that the necessary communication takes place between and among sectors and stations to minimize double-counting when subjects cross over multiple areas of responsibility.
- **Supervisory reviews of data entries.** With regard to data on AMO vessel and aircraft missions, AMO guidance mandates that supervisors perform a review of all pre- and post-mission data entries to help ensure accurate entry of mission information. AMO officials confirmed that supervisors review the data being entered into the database.[29] Additionally, officials said AMO data teams run monthly validation checks of data entered to check for completeness and accuracy, such as out-of-range values.
- **Using built-in electronic safeguards.** CBP's databases for entering and maintaining data elements—including travelers or passengers seeking admission, known inadmissible aliens at POEs, referrals for secondary examinations, major infractions, and private vehicles processed at a POE—have built-in processes to detect and prevent potential data entry errors.[30] More specifically, as an officer enters a record, the systems check for valid entries into relevant fields and provide an error message to the officer for entries that appear to be invalid (e.g., if an officer leaves a mandatory field blank or enters contradictory information such as charging an individual with a crime

[29]These data are entered into the Tasking, Operations, and Management System database. This database consolidates the data required for AMO maritime and aviation operations, including mission planning; mission execution; and processing of information on apprehensions, assaults, and got aways.

[30]These data are entered into the TECS (not an acronym), Consolidated Secondary Inspection System, and Secure Integrated Government Mainframe Access databases. A major infraction is an arrest at a POE, including arrests related to terrorism, drugs, criminal aliens, and currency, among other things.

while also entering a request for expedited removal).[31] In some cases, the systems will prevent a record from being saved if any required fields are blank.

- **Comparing data against other sources.** As part of the Coast Guard's data reliability processes for data on maritime migrant interdictions used in the "known maritime migrant flow rate" metric, Coast Guard officials said that analysts cross-check the data entered into their database with other Coast Guard reporting documents, such as internal spreadsheets, to ensure accuracy.[32]
- **Independent assessment of performance measure data.** Some border security metrics are similar to, or use the same data elements as, performance measures DHS reports annually in response to the Government Performance and Results Act Modernization Act (GPRAMA) of 2010.[33] For those performance measures, DHS annually assesses a subset of measures and their data for completeness and reliability using independent review teams. For example, in May 2017 an independent review team assessed the "migrant interdiction effectiveness in the maritime environment" performance measure, which uses the same data as the border security metric, "known maritime migrant flow rate." The review team found the measure to be complete and reliable and the data to be of good quality overall, but also recommended that the Coast Guard and DHS continue work on an improved database to enhance the consistency of data collection, among other things.

In addition to the components having processes to help ensure the reliability of the data and the quality of the information used in the report, DHS took steps to be transparent in its presentation of the metrics by identifying and disclosing known limitations with some of the data

[31]Under expedited removal, a DHS officer may, subject to statutory criteria, order arriving and other designated foreign nationals removed from the United States without a formal removal proceeding.

[32]These data are entered into the Coast Guard's Marine Information for Safety and Law Enforcement database.

[33]Pub. L. No. 111-352, 124 Stat. 3866 (2011). GPRAMA updated the Government Performance and Results Act of 1993, Pub. L. No. 103-62, 107 Stat. 285 (1993). Examples of GPRAMA performance measures that are similar to or use the same data elements used by one or more border security metric include the percent of inbound cargo identified by CBP as potentially high-risk that is assessed or scanned prior to departure or at arrival at a U.S. POE, percent of people apprehended multiple times along the southwest border, rate of interdiction effectiveness along the southwest border between POEs, and migrant interdiction effectiveness in the maritime environment.

elements or methodologies used for the metrics in its report. Communicating the extent to which such limitations exist and their potential impact is important to help facilitate the appropriate use and understanding of the data and the metrics.[34] DHS identified and disclosed limitations related to the potential for misclassification of observations, the potential for cases not being entered or recorded correctly, and methodological limitations, among other things. For example, one of the key limitations DHS's report identified for the data on turn backs and got aways is that they are based on potentially subjective observations of agents who have to make a determination on how to classify them based on what they observed or the available evidence (e.g., tracks, sensor activations, interviews with apprehended subjects, camera views, etc.). Further, DHS's report explained that agents may face challenges in making that determination because some unlawful border crossers may enter the United States to drop off drug loads or to act as decoys to lure agents away from a certain area and then return to Mexico, and therefore may be misidentified as turn backs, for example. As another example, DHS identified limitations due to cases not being entered or recorded correctly. For the "known maritime migrant flow rate" metric, DHS used data on the total number of maritime migrants interdicted. In its report, DHS explained that a potential limitation of this data element is that the Coast Guard relies on international and domestic partners to report their interdictions for compilation in its database. Consequently, the accuracy and completeness of the data depend on whether those reports are made by those partners and the accuracy of their reports. See appendix I for additional information about the limitations identified for each metric.

Even as DHS identified and disclosed limitations related to some of its metrics, we identified at least one additional limitation for 21 of the 35 metrics on which DHS reported where DHS did not disclose such limitations or could have been more transparent about the limitations in its report. Examples of such instances include:

- **Potential for cases not being entered or recorded correctly.** In our previous work we found that mission data for unmanned aerial

[34]GGD-99-139.

systems were inconsistently collected across operation locations.[35] Specifically, in February 2017 we reported that there were instances where no assist information was recorded in AMO's data system even though such assets participated in investigations and operations. Because AMO's data may not reflect all asset assists, we recommended that AMO update and maintain guidance for recording mission information in its data collection system and provide training to users of the system.[36] For its fiscal year 2017 *Border Security Metrics Report*, DHS used asset assists data in metrics such as the "AMO individuals detected," "AMO apprehensions assisted," and "illicit drug seizures assisted by AMO," but did not disclose this limitation in its report.[37]

- **Potential for data to be changed over time.** Border Patrol officials told us that data on the apprehension of unaccompanied alien children may change over time because original apprehension records from a shared database have, in some instances, been updated by staff from U.S. Immigration and Customs Enforcement (ICE) Enforcement and Removal Operations (ERO).[38] Officials said that in January 2015 they noticed that ERO staff were inadvertently overwriting Border Patrol's original data entries about the status of apprehended children when they made updates to those children's records. For example, if a child was unaccompanied at the time of his or her apprehension and was recorded as such by Border Patrol in the initial record entry, ERO may have changed the "unaccompanied" status in the system after they matched the child with a family

[35]GAO, *Border Security: Additional Actions Needed to Strengthen Collection of Unmanned Aerial Systems and Aerostats Data*, GAO-17-152 (Washington, D.C.: Feb. 16, 2017). CBP uses the term "unmanned aircraft systems" for these assets. An unmanned aerial system is composed of a remotely-piloted aircraft, a ground control station, a digital network, and other ground support equipment and personnel required to operate and maintain the system. An example of such a system is the Predator B which is equipped with video and radar surveillance technology to conduct border security efforts.

[36]DHS implemented these recommendations in July 2018, but this limitation is relevant because the data presented in DHS's fiscal year 2017 *Border Security Metrics Report* were collected prior to the implementation of the recommendations.

[37]6 U.S.C.§ 223(e)(1)(E), (F), (G).

[38]An unaccompanied alien child is one under 18 years old with no lawful immigration status, and no parent present and available in the United States to provide care and physical custody. 6 U.S.C. § 279(g)(2).

member or sponsor. As a result, data may not be reconcilable with initial apprehension counts over time.[39]

- **DHS did not fully disclose limitations for some metrics.** We identified instances where DHS could improve transparency about the assumptions or limitations of the data presented in its report. For example, in 2014 Border Patrol implemented a standard, southwest border-wide methodology to improve reporting of turn backs and got aways.[40] While DHS made mention of this change in the text of the report, the data for these metrics are presented in tables without any table notes or disclosures within the table about this change. Further, DHS's report does not discuss how the change may affect comparability of the data. Consequently, a reader may not be aware that data for before 2014 in a table are not necessarily comparable to the data for 2014 and after in the same table.

Without a comprehensive identification of the limitations of the metrics and their associated data, and without an adequate disclosure of those limitations, the value of DHS's report as a source of information to Congress, policymakers, and the public may be diminished. The metrics in the report were specifically identified and requested by Congress in the NDAA, and provide Congress with important information about the outputs and outcomes of DHS's border security policies and investments that could be used to inform decision-making. However, those reading the report may not be aware of important contextual information because DHS did not identify and disclose some limitations, thereby creating the potential for the data to be misinterpreted.

According to DHS officials who prepared the report, while they took steps to identify methodological limitations of the metrics, no process currently exists to systematically review the reliability of operational data used for public reporting purposes, such as in the metrics report. Specifically, DHS officials within OIS told us that while they were responsible for leading and managing the preparation of the report, they largely relied on the DHS components from which they collected the data to assess the data's reliability and communicate identified limitations. OIS officials explained that many of the data elements used, such as those from AMO or the Coast Guard, were ones with which they were not familiar or had not

[39]This limitation is relevant because the time period for the data on apprehensions of unaccompanied alien children that DHS provided in its fiscal year 2017 *Border Security Metrics Report* runs from fiscal year 2008 through fiscal year 2016.

[40]6 U.S.C. § 223(a)(3), (9), (b)(1)(A)(iv), (v).

worked with previously in their area of immigration statistics. OIS officials also noted that in some cases, the data had previously been used in performance measures or had been collected and tracked for several years, so they trusted the components' processes for ensuring their reliability and identifying limitations, but reviewed the data provided where possible and consulted with the components as needed. However, OIS officials said that while they included as much information in the report as was known about identified limitations with the existing operational data, no additional effort was made to systematically review the underlying reliability of the data to comprehensively identify limitations that should be acknowledged when publicly reported because no department-wide process exists to do so.

Standards for Internal Control in the Federal Government state that management officials should evaluate data sources for reliability and communicate quality information, including relevant data from reliable sources, to achieve an agency's objectives.[41] The quality information can then be used by agency management and external stakeholders such as policymakers, to make informed decisions and evaluate performance, among other things. Further, DHS's *Management Directive on Information Quality* states that data and information disseminated by the department should, among other things, have full, accurate, transparent documentation, and error sources affecting data quality should be identified and disclosed to users.[42] Additionally, our previous work on approaches for verifying and validating performance information found that communicating significant data limitations and their implications allows stakeholders to judge the data's credibility for their intended use and to use the data in appropriate ways.[43] By developing and implementing a process to systematically review the reliability of the data or consider the results of assessments components have completed, comprehensively identify any limitations, and communicate the data or methodological limitations with the metrics, DHS would improve the quality of the information available to Congress, DHS leadership, and the public. Doing so would also facilitate a better understanding and appropriate interpretation and use of the data in the context of the *Border*

[41]GAO-14-704G.

[42]Department of Homeland Security, *Management Directive 8200.1: Information Quality,* March 1, 2003.

[43]GAO/GGD-99-139.

Security Metrics Report, thereby enhancing the report's value as a source of information for future decision-making.

DHS's Model to Estimate Unlawful Border Entries Uses Assumptions that Have Not Been Validated and Does Not Convey Uncertainty of Estimates

DHS Used a Statistical Model to Estimate Unlawful Border Entries for Three Metrics

Based upon statistical modelling, DHS developed a Model-based Apprehension Rate to calculate the total number of unlawful border entries between land POEs, including entries both detected by Border Patrol and "estimated undetected unlawful entries." DHS reported that in fiscal year 2016 there were about 624,000 detected entries (which include apprehensions, turn-backs, and got aways) and estimated that there were about 62,000 undetected unlawful entries. DHS also used the Model-based Apprehension Rate to develop two other metrics in the fiscal year 2017 *Border Security Metrics Report*:

(1) A "probability of detection rate," which is the estimated proportion of the number of detected unlawful border entries to the total number of unlawful entries between land POEs. DHS estimated that in fiscal year 2016, 91 percent of unlawful border crossers were detected and 9 percent were not detected.

(2) The "attempted unlawful border crosser apprehension rate," which is the estimated proportion of unlawful border entrants apprehended by Border Patrol to the total number of unlawful entrants between land POEs. DHS estimated that in fiscal year 2016, 65 percent of individuals were apprehended by Border Patrol and 35 percent of individuals attempting an unlawful border entry either got away or entered the United States undetected.

DHS based its statistical model upon research conducted by the Institute for Defense Analyses that leveraged long-standing research using

capture-recapture models.[44] Originally developed and utilized in biological and ecological sciences, capture-recapture models have been applied to other disciplines, including social science.[45] According to the Institute for Defense Analyses, capture-recapture models have been the core approach for academic efforts to model the process of unlawful entry into the United States across land borders for several decades.[46]

To develop its statistical model, DHS used a capture-recapture methodology to calculate a probability of apprehension by counting the number of unlawful border crossers that were apprehended multiple times. At a high-level, capture-recapture involves taking an initial sample of the population of interest, in this case individuals attempting to cross the border unlawfully. Then, separately, a second, independent sample of the same population is taken. The samples are then compared to determine the number of individuals who appear in both samples. When the number of individuals who appear in both samples (e.g., individuals who have been apprehended twice) is low, it can be inferred that the overall population of interest (e.g., total unlawful border crossers) is much larger than the total number of individuals in the two samples. On the other hand, if the recapture rate is high, then it can be inferred that the overall population of interest is not much larger than the total number of individuals in the two samples.

In the context of unlawful border crossing, when an individual's first attempt at unlawfully crossing the border is successful, the individual enters the United States and no apprehension is made. However, if an individual is apprehended, Border Patrol records an apprehension of this

[44]In its report, DHS refers to this methodology as the "repeated trials model" methodology. DHS contracted with the Institute for Defense Analyses to help the department produce a mathematical estimate of illegal entries.

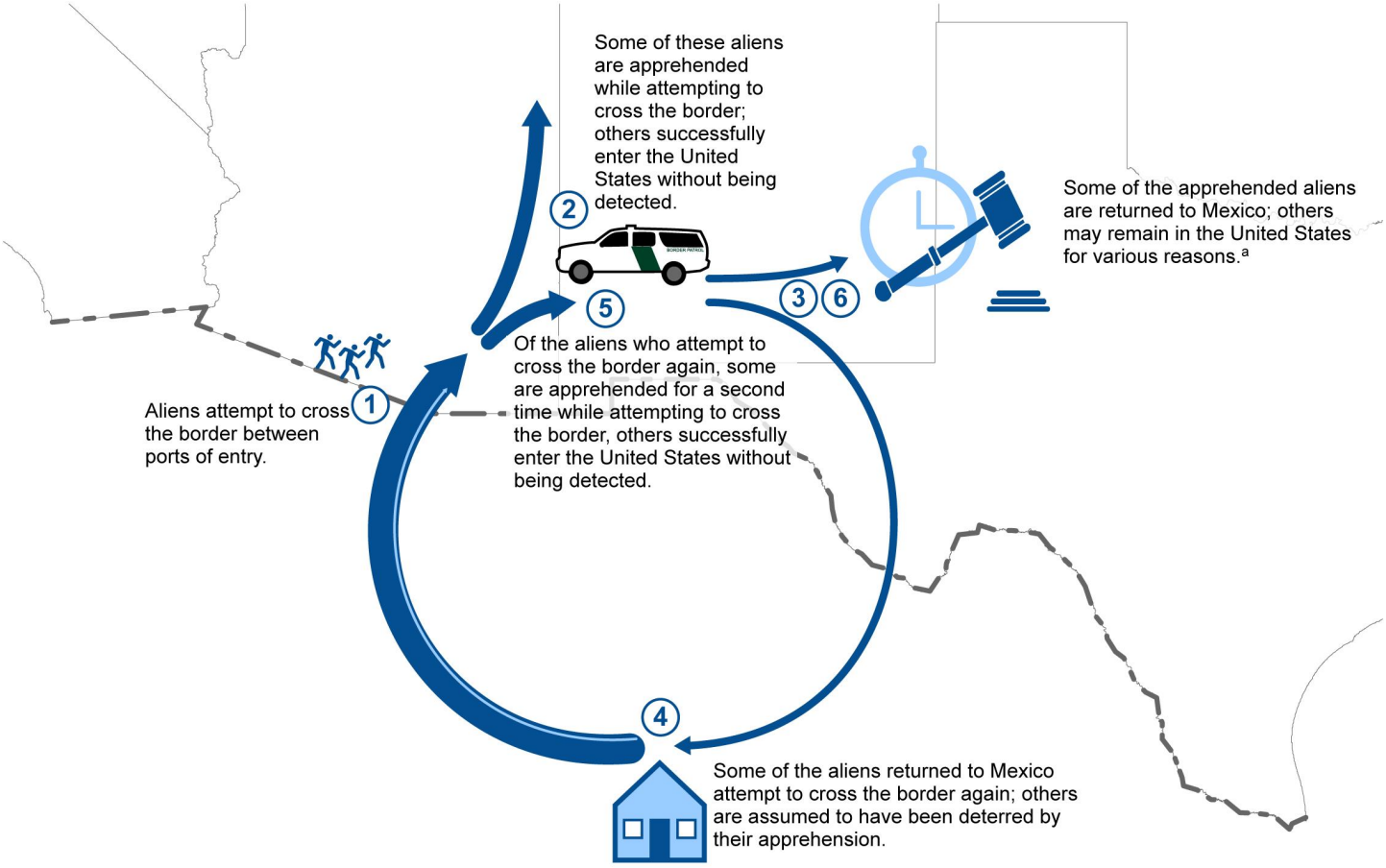
[45]Anne Chao, "An Overview of Closed Capture–Recapture Models," *Journal of Agricultural, Biological, and Environmental Statistics*, vol. 6, no.158 (2001).

[46]According to the Institute for Defense Analyses, the capture-recapture methodology has been used to estimate unobserved flows at the border since being published in 1990 by Thomas Espenshade, who used data from the period 1977-1988 and relied on estimates by Border Patrol agents of the proportion of people whom they caught who were recognized as "repeaters" who had recently been caught in the same area. See Thomas Espenshade, "Undocumented Migration to the United States: Evidence from a Repeated Trials Model," in *Undocumented Migration to the United States: IRCA and the Experience of the 1980s*, ed. Frank D. Bean, Barry Edmonston, and Jeffrey S. Passel (Washington, DC: The Urban Institute Press, 1990), 159-181).

individual in a DHS data system and the individual is potentially subject to consequences for entering unlawfully, such as administrative enforcement and removal, criminal prosecution, or being barred from legally entering the United States in the future. The individual is then returned to his or her home country, where the individual can then choose whether or not to make another attempt to unlawfully cross the border.[47] During a second attempt to unlawfully cross the border, the individual faces the same possible outcomes (enter the United States unlawfully or apprehension by Border Patrol). Figure 2 provides the framework for DHS's Model-based Apprehension Rate.

[47]If an individual chooses not to make another attempt to unlawfully cross the border, the statistical model makes no further assumption about the individual's actions.

Figure 2: Framework for Department of Homeland Security's (DHS) Model-based Apprehension Rate



Source: GAO analysis of DHS's Model-based Apprehension Rate. | GAO-19-305

[a]These reasons include awaiting removal to their home country, resolution of immigration proceedings, resolution of criminal proceedings, or serving terms of imprisonment.

DHS modified the traditional capture-recapture methodology by calculating a deterrence rate of 60 percent in fiscal year 2016 to account for individuals who choose not to make another unlawful border crossing attempt.[48] The deterrence rate accounts for an individual being deterred from attempting to unlawfully cross the border again; that is, DHS assumed that some percentage of apprehended individuals, once

[48]Without accounting for deterrence, capture-recapture assumes that unlawful border crossers are never deterred at the border and thus keep trying to enter until they are successful.

returned to their country, will remain in their home country. DHS calculated the deterrence rate based upon a survey of Mexican individuals who were apprehended and returned to the border region of Mexico by U.S. immigration authorities.[49] DHS assumed the remaining 40 percent of individuals who were apprehended and removed to their home country in fiscal year 2016 remain undeterred and will attempt to unlawfully cross the border again.

Historically, DHS (and its predecessor the Immigration and Naturalization Service) did not use statistical models to calculate an apprehension rate but relied on apprehensions as a proxy measure for all unlawful entries (both observed and unobserved) between POEs. DHS also included in its report information on the apprehension rate using this method. Specifically, DHS also calculated an Observational Apprehension Rate based on direct observations (unlawful border crossers observed by Border Patrol) and indirect observations (residual evidence of a border crosser, i.e., footprints) of attempted unlawful border crossers. Using the observational apprehension rate, DHS calculated that in fiscal year 2016, it apprehended 79 percent of unlawful border crossers.

DHS's Statistical Model Uses Assumptions about Border Crossers that Have Not Been Validated and May Affect Results

DHS made assumptions about border crossers to develop its statistical model and described these assumptions in its report; however, DHS did not validate some of these assumptions or determine how they potentially could affect the accuracy of the Model-based Apprehension Rate through the use of sensitivity analyses.

More specifically, DHS's model incorporates several assumptions related to border crossers. Among others, these assumptions include:

- the rate at which individuals will be deterred from crossing again remains the same, regardless of the number of attempts an individual has made;

[49]The survey, Encuesta sobre Migración en las Frontera Norte de México, is conducted by a Mexican research center, El Colegio de la Frontera Norte. The survey website can be accessed at http://www.colef.mx/emif/.

- individuals who indicate an intent to stay near the U.S.-Mexico border will attempt re-entry;
- a single apprehension rate applies to diverse groups of border crossers, regardless of their nationality or the number of attempts an individual has made; and
- certain individuals will not evade Border Patrol.

However, the validity of some of these assumptions—which affect the Model-based Apprehension Rate—is uncertain. For example, DHS's model estimates the rate at which a diverse group of border crossers attempting to evade detection will be apprehended by Border Patrol. This group includes both Mexicans and non-Mexicans and individuals who attempt to cross again after varying amounts of time. Despite this diversity, the model assumes that all crossers have the same chance of apprehension on each attempt to cross the border. This assumption allows DHS to apply the estimated apprehension rate developed based on a sample of Mexicans re-apprehended within 90 days—the group for whom relevant data exist—to a broader population of individuals regardless of the number of attempts the border crossers have made or their nationality.[50] However, DHS did not make efforts to determine the extent to which an apprehension rate based on Mexican citizens re-attempting entry within 90 days would reflect apprehension rates for non-Mexicans and individuals crossing again after longer periods.

Additionally, DHS assumes that the apprehension rate never varies between an individual's attempts at crossing the border. For example, DHS assumes that an individual making a first attempt at crossing the border faces the same odds of apprehension as an individual making a fourth or fifth attempt at crossing the border. However, DHS has not explored the possibility that, for example, individuals may gain experience and knowledge from border-crossing attempts that could help them better evade Border Patrol on subsequent attempts.

[50]To estimate the overall Model-based Apprehension Rate, DHS uses a survey of Mexicans apprehended and removed from the United States, which asks about their intentions to return to the United States within the next 7 to 90 days. These data allow DHS to estimate a rate at which individuals are deterred from crossing again. The model uses this estimated deterrence rate to estimate the chance that a restricted sample of Mexicans re-apprehended within 90 days will be apprehended again on a subsequent crossing attempt. Finally, the model applies this apprehension rate to a larger population of individuals whom the model identifies as repeatedly trying to cross the border undetected, in order to estimate the overall Model-based Apprehension Rate. This larger group includes Mexicans and non-Mexicans, with varying time periods between attempts.

Further, DHS's model assumes that certain individuals unlawfully crossing the border, such as those seeking asylum, will not evade apprehension and will turn themselves in to Border Patrol. Specifically, in addition to individuals who ultimately do seek asylum, DHS also includes within this group and applies this assumption to individuals apprehended as a family unit and unaccompanied minors. Under this assumption, 100 percent of such individuals are apprehended. According to DHS's fiscal year 2017 *Border Security Metrics Report*, these individuals have historically been released into the United States with a Notice to Appear in immigration court for legal proceedings on a future date, rather than being subject to immediate DHS enforcement consequences such as voluntary return.[51] Therefore, DHS assumes that 100 percent of these individuals will self-present to Border Patrol because, in doing so, they are able to claim asylum or other protection and potentially remain in the United States.

However, representatives from the Institute for Defense Analysis stated that while anecdotally self-presenting rates of these individuals are high, more rigorous analysis is needed to accurately estimate a self-presentation rate. For example, it is possible that not all families crossing the border unlawfully may seek to self-present to Border Patrol; some may attempt to evade capture and enter the United States undetected. In this case, DHS may be underestimating the number of individuals who unlawfully cross the border and enter the United States by assuming 100 percent of these individuals will self-present to Border Patrol agents. Additionally, DHS noted in its fiscal year 2017 *Border Security Metrics Report* that this assumption does not reflect the actual behavior of all border crossers in this group. OIS officials stated that they based this assumption on interviews with Border Patrol agents but had not done formal or quantitative analysis to support this assumption. Further, OIS officials stated that they did not have a strong alternative assumption to use instead and therefore assumed that 100 percent of individuals within this group are apprehended.

DHS described these assumptions in its report but did not provide quantitative information on the extent to which these assumptions affected the Model-based Apprehension Rate through the use of sensitivity analyses. Sensitivity analyses help to convey the extent to

[51]Voluntary return allows individuals to voluntarily depart from the United States in lieu of being subject to formal removal or expedited removal proceedings, thereby effectively withdrawing as an applicant for admission.

which changing the values of variables, assumptions, data, or other input affects statistical estimates. For example, sensitivity analyses could provide information on how different assumptions about unlawful border crossers' behavior and other inputs to the statistical model could have affected the Model-based Apprehension Rate. OIS officials stated that while they had started to run sensitivity analyses by modifying certain assumptions, they had not completed the analysis and did not include results of the sensitivity analyses in the report.

The Office of Management and Budget's (OMB) statistical standards for federal agencies include providing the results of sensitivity analyses for key methodological assumptions to ensure that these assumptions do not unduly affect the results of the model.[52] By including the results of sensitivity analyses in its *Border Security Metrics Report*, DHS would allow Congress and the public to better understand the potential limitations associated with its model and make independent assessments on its accuracy.

DHS Did Not Convey the Statistical Uncertainty of Its Estimated Apprehension Rate

DHS used a statistical model to develop the Model-based Apprehension Rate but did not provide information on the level of uncertainty related to this estimate. Rather, the fiscal year 2017 *DHS Border Security Metrics Report* provided a single rate that does not fully convey the difficulty and uncertainty of estimating partially unobserved metrics, such as unlawful entries and the probability of detection. Specifically, using the Model-based Apprehension rate, DHS estimated that 65 percent of unlawful border crossers were apprehended in fiscal year 2016, and the remaining 35 percent entered the United States. However, like all statistical models, DHS's estimate is based upon a limited sample of data and may be affected by random variation, meaning that DHS does not have complete certainty that its rate is accurate. DHS included a discussion of limitations in the report but did not quantify its degree of uncertainty.

According to the OMB statistical standards for federal agencies, possible variation in estimates should be noted, such as by reporting the range of

[52]OMB, *Standards and Guidelines for Statistical Surveys* (Washington, D.C.: September 2006).

each estimate.[53] Measures of statistical uncertainty, such as margins of error or confidence intervals, help to convey the amount by which estimates might vary due to randomness in the data and allows consumers of the estimates to evaluate their accuracy.[54]

OIS officials stated that they agree that providing measures of statistical uncertainty would help Congress and the public better understand the Model-based Apprehension Rate to evaluate border security. Officials told us that the office had begun to develop measures of statistical uncertainty but did not complete this effort because the staff member who was working on the analyses recently left the office. Further, OIS officials stated that they were unsure when they would be able to provide measures of statistical uncertainty in future reports. Including measures of statistical uncertainty in future reports would allow Congress, policy makers, and the public to more fully evaluate the extent to which the metrics that use the Model-based Apprehension Rate are valid. Further, while DHS may ultimately adopt a new, simulation-based model in the future, described later in this report, it plans to use the current Model-based Apprehension Rate for estimates in its *Border Security Metrics Report* for the foreseeable future. Therefore, providing this additional information about the estimates would allow DHS to more accurately convey how limitations in available data and methods could affect the results and provide more useful information about migration and border enforcement. Additionally, to the extent DHS adopts a new estimating metric, that estimate may have some level of uncertainty associated with it.

DHS Is Developing Another Model to Better Reflect Unlawful Border Entries at the Border

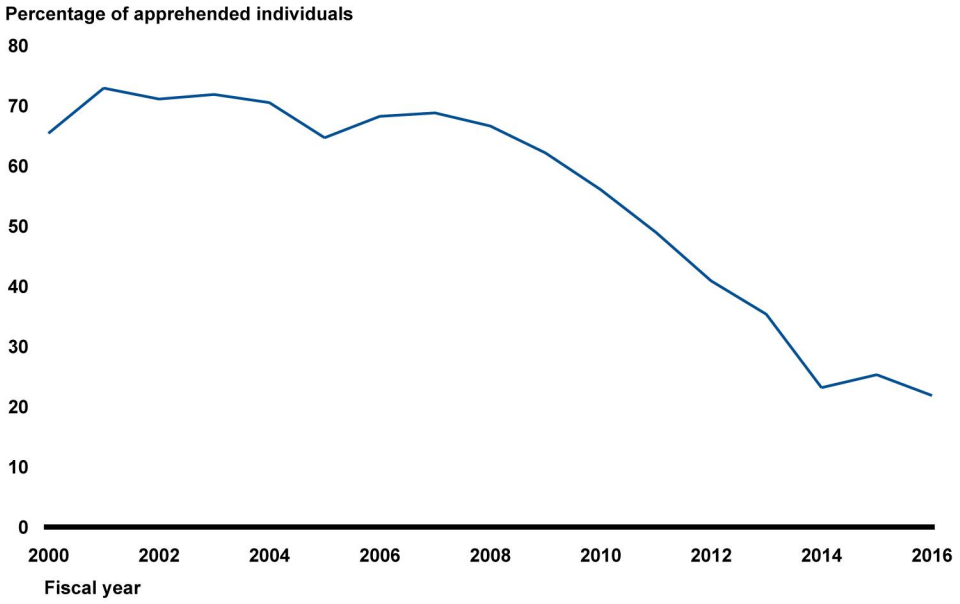
DHS is developing another model because its current statistical model may not sufficiently reflect conditions at the southwest border. Specifically, DHS's current statistical model does not fully account for the changing population of unlawful border crossers. The capture-recapture

[53]OMB, *Standards and Guidelines for Statistical Surveys* (Washington, D.C.: September 2006).

[54]A margin of error (or confidence interval) provides the range around a statistical estimate where the true value is likely to exist. If an estimate's margin of error is small, the estimate has a lower amount of random error and is therefore more precise and known with greater certainty.

methodology, which underlies the Model-based Apprehension Rate, was developed to sample homogenous populations that behave in set, uniform ways. However, those crossing the border have become increasingly diverse in recent years. Our analysis of DHS data used to develop the Model-based Apprehension Rate shows that the number of unlawful border crossers whose characteristics and behavior are best reflected in the statistical model has declined. For example, our analysis illustrated that the population that conforms best to the model's assumptions—adult Mexicans travelling without dependents who do not plan to claim asylum and who are returned to Mexico in a short amount of time—has fallen from over 60 percent of apprehensions in fiscal year 2000 to less than 25 percent of apprehensions in 2016, as shown in figure 3.

Figure 3: Apprehensions Reflected in the Department of Homeland Security's Statistical Analysis to Estimate Undetected Unlawful Entries



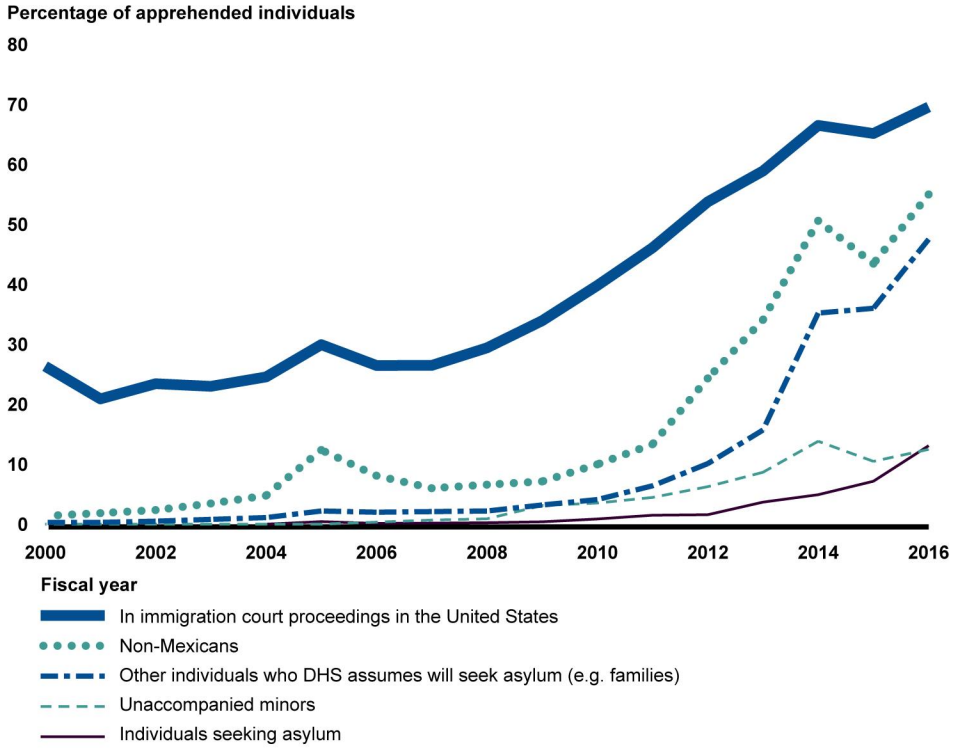
Source: GAO analysis of Department of Homeland Security data. | GAO-19-305

Note: These apprehensions include apprehensions of adult Mexicans travelling without dependents who do not plan to claim asylum and who are returned to Mexico in a short amount of time.

Conversely, the number of individuals who are excluded from the statistical model such as non-Mexicans, and individuals whose behavior may not reflect the model's assumptions, such as asylum-seekers or those who have not departed the United States (e.g., because they are awaiting immigration court proceedings) have increased over time, as shown in figure 4. For example, the percentage of individuals

apprehended at the border who are excluded from the model because they await immigration court proceedings increased from 26 percent in fiscal year 2000 to almost 70 percent in fiscal year 2016.[55]

Figure 4: Individuals Apprehended at the Border Who Are Not Included in the Department of Homeland Security's (DHS) Model-based Apprehension Rate



Source: GAO analysis of Department of Homeland Security data. | GAO-19-305

DHS acknowledged these trends in its fiscal year 2017 *Border Security Metrics Report* and noted them as a limitation to the effectiveness of its model. OIS officials further noted that some of these limitations are difficult to address within the bounds of the statistical model. For example, to properly account for non-Mexicans, OIS officials stated that they would need information on the rate at which non-Mexicans are deterred from crossing the border. However, it would be difficult and costly to obtain this

[55]We previously found that case backlogs at the nation's 58 immigration courts have grown and that, as a result of these backlogs, some immigration courts were scheduling hearings several years in the future. See GAO, *Immigration Courts: Actions Needed to Reduce Case Backlog and Address Long-Standing Management and Operational Challenges,* GAO-17-438 (Washington, D.C.: June 1, 2017).

information through the use of a survey and real-world data does not already exist, according to OIS officials.

To help address limitations of its current statistical model, DHS has invested in another research project to estimate the number of unlawful border crossers between land POEs, including unknown border entries. Border Patrol contracted with Johns Hopkins Applied Physics Laboratory to undertake a project that aims to use a combination of statistical modeling and data from sensors along the border to estimate the total number of unlawful border entries between land POEs, including entries both detected by Border Patrol and those not detected by Border Patrol.[56] According to project documentation we reviewed, the project plans to leverage the CBP Tactical Simulation, an agent-based simulation of tactical border operations.[57] CBP Tactical Simulation incorporates information on terrain at the border based on geographic information systems and sensors along with probability models that reflect how Border Patrol agents and unlawful border crossers behave in given circumstances.

Border Patrol and OIS officials told us that this project would be more adaptable to changing border conditions and could help the agency address limitations associated with the Model-based Apprehension rate. Specifically, according to OIS officials, a simulation-based estimate would rely upon fewer assumptions about the types of individuals who unlawfully cross the border as compared to the current Model-based Apprehension rate. However, Border Patrol officials noted that estimates of unobservable phenomena, such as unobserved border entries, always face some limitations in their accuracy and that the new model may still rely upon samples of data that would have associated uncertainty as well as assumptions that would need to be validated. Ultimately, though,

[56]Sensors include infrared and daylight camera systems, radar, and unattended ground sensors. The simulation-based model takes into account the line of sight from the sensor, the field of view of the sensor, and the probability of detection based on sensor type (e.g. type of radar or camera), among other things.

[57]Agent-based models are computer models that attempt to capture the behavior of individuals within an environment. An agent is programmed to behave and interact with other agents and the environment in certain ways. Agent-based models may be particularly useful when interactions and behaviors are known or suspected to exist but cannot be observed easily in the real world. Agent-based modeling differs from traditional, regression-based methods in that it allows for the exploration of a greater array of behaviors and interactions.

Border Patrol officials stated that the simulation-based model may be an improvement upon the current Model-based Apprehension rate.

Border Patrol officials stated that the first iteration of the model would be presented to Border Patrol leadership for their review at the end of fiscal year 2019 and if at that time Border Patrol leadership approves the model, the earliest the simulation-based estimate could potentially be incorporated into the DHS *Border Security Metrics Report* would be for fiscal year 2020. Exploring alternative models is a positive step for DHS, however given that the project is in the early stages, it is too early to tell if it will be able to address the limitations we identified associated with the current model.

Our Prior Work Has Identified Other Metrics DHS Could Use to Help Measure the Effectiveness of Border Security

In addition to the NDAA metrics, we have identified other metrics that DHS could use to help measure the effectiveness of border security.[58] In particular, based on the findings from our previous reviews of border security programs and efforts, we have recommended that DHS use metrics that are relevant to each of the four domains listed in the NDAA—

[58]In its fiscal year 2017 *Border Security Metrics Report,* DHS also provided information and data on three additional metrics that were not specifically called for by the NDAA: 1) selected characteristics of recent apprehensions, 2) at-the-border deterrence, and 3) border-crossing costs. This additional information was provided to respond to a separate NDAA requirement for DHS to issue a “State of the Border” report in which DHS was to include trends and analyses related to border security metrics, and “any other information that the Secretary determines appropriate.” See 6 U.S.C. § 223(g)(3).

between POEs, at POEs, the maritime border, and for air and marine security in the land domain.[59] For example,

- **Between POEs domain.** In February 2017, we reported on the use of border fencing along the southwest border and found that CBP collects data that could help provide insight into how border fencing contributes to border security operations, including the location of illegal entries.[60] For example, we found that CBP collects data it could potentially use to determine the extent to which border fencing diverts illegal entrants into more rural and remote environments, and border fencing's impact, if any, on apprehension rates over time. However, CBP had not developed metrics that systematically use these data to assess the contributions of border fencing to its mission. To better position CBP to make resource allocation decisions with the best information available to inform competing mission priorities and investments, we recommended that the Chief of the Border Patrol develop metrics to assess the contributions of pedestrian and vehicle fencing to border security along the southwest border using CBP data. DHS agreed with the recommendation and stated that it planned to develop metrics for use in its operational control framework for southwest border security operations. As of October 2018, DHS stated that the department planned to test the metrics and implement them in the framework by September 2019.

[59]As part of our analysis, we also reviewed reports by the DHS OIG related to border security to identify any open recommendations it has made that focused on establishing metrics that DHS could use to help measure the effectiveness of border security. As of January 2019, DHS had implemented the DHS OIG recommendation we identified. In 2017 the DHS OIG conducted a review of the effectiveness of information technology systems to support CBP's border security objective of preventing the entry of inadmissible aliens and found that CBP's information technology systems and infrastructure did not fully support this objective. As a result, the DHS OIG recommended that CBP assess the need for performance measures to monitor, evaluate, and ensure the availability of primary traveler screening applications from CBP personnel's perspective at POEs. According to the DHS OIG, as of June 2018, CBP had taken steps to implement this recommendation and the DHS OIG closed the recommendation accordingly. See DHS, OIG, *CBP's IT Systems and Infrastructure Did Not Fully Support Border Security Operations,* OIG-17-114 (Washington, D.C.: Sept. 28, 2017).

[60]GAO-17-331.

- **At POEs domain.** In July 2017, we reported on the Importer Security Filing (ISF) program[61] and found that while ISF rule data have improved the program's ability to identify high-risk cargo shipments, CBP could collect additional performance information to better evaluate program effectiveness.[62] While evaluating the direct impact of using ISF rule data to assess shipment risk is difficult, we identified examples of how CBP could better assess the ISF program's effectiveness. For example, CBP could track the number of containers not listed on a manifest—which could pose a security risk—it identifies through reviewing vessel stow plans. Collecting this type of additional information would help CBP better assess whether the ISF program is improving its ability to identify high-risk shipments. Therefore, we recommended that CBP identify and collect additional performance information on the impact of the ISF rule data, such as the identification of shipments containing contraband, to better evaluate the effectiveness of the ISF program. DHS agreed with the recommendation and reported that it is working to assess additional performance metrics to evaluate the effectiveness of the ISF program and anticipates completing the assessment by end of December 2019.
- **Maritime border domain.** In October 2017, we reported on the Coast Guard's performance goals and found that although the Coast Guard's performance goals are generally aligned with its statutory missions, the Coast Guard does not explain why certain aspects of mission performance are measured while others are not.[63] For example, we found that while the Coast Guard's mission is to interdict all illegal drugs, the agency's two performance goals related to that

[61]In January 2009, CBP implemented the ISF and Additional Carrier Requirements, generally referred to as the "ISF rule." Importer Security Filing and Additional Carrier Requirements, 73 Fed. Reg. 71,730 (Nov. 25, 2008) (codified at 19 C.F.R. pts. 4, 12, 18, 101, 103, 113, 122, 123, 141, 143, 149, 178, & 192).The ISF rule requires that importers (who order containerized and break bulk goods—commodities such as bound lumber or goods stacked on wooden pallets—to be shipped from foreign sources to the United States via oceangoing vessels) and vessel carriers (who physically transport goods from foreign ports to ports in the United States) submit additional cargo information, such as country of origin, to CBP before the cargo is loaded onto U.S.-bound vessels. See 19 C.F.R. §§ 4.7c, 4.7d, 149.1-149.6.

[62]GAO, *Supply Chain Security: CBP Needs to Enforce Compliance and Assess the Effectiveness of the Importer Security Filing and Additional Carrier Requirements,* GAO-17-650 (Washington, D.C.: July 20, 2017).

[63]GAO, *Coast Guard: Actions Needed to Enhance Performance Information Transparency and Monitoring,* GAO-18-13 (Washington, D.C.: Oct. 27, 2017).

mission were for cocaine interdiction only, excluding many other substances. We recommended that the Coast Guard either develop new performance goals to address mission activity gaps, or explain in the Coast Guard's Annual Performance Report why certain aspects of mission performance are measured while others are not. Developing new goals to address missions, or describing how existing goals sufficiently assess mission performance, could better convey the Coast Guard's progress in achieving its missions.

DHS agreed with the recommendation and in February 2018, the Coast Guard provided us with its updated fiscal year 2017 Annual Performance Report. We found that while the updated report explained why performance goals related to its drug interdiction mission focus solely on cocaine interdiction, for the four other performance goals we previously identified as not fully addressing all related mission activities, the updated report did not include additional goals or explain why certain aspects of mission performance are not measured. We continue to believe that in instances in which performance goals do not fully address all of the respective mission activities, the Coast Guard's Annual Performance Report should include an explanation.

- **Air and marine security in the land domain.** In May 2017, we reviewed DHS's efforts to address subterranean, aerial, and maritime smuggling of drugs and humans.[64] We found that while DHS established high-level performance measures and collected data on smuggling by ultralight aircraft, it had not assessed its efforts specific to addressing this smuggling method. Additionally, we found that DHS had similarly not assessed smuggling methods such as tunnels, panga boats (a fishing vessel), and recreational vessels. We recommended that DHS direct CBP, ICE, and Coast Guard to establish and monitor performance measures and targets related to ultralight aircraft, cross-border tunnels, panga boats, and recreational vessel smuggling to help provide reasonable assurance that efforts to address these smuggling methods are effective.[65] By establishing

[64]GAO, *Border Security: Additional Actions Could Strengthen DHS Efforts to Address Subterranean, Aerial, and Maritime Smuggling,* GAO-17-474 (Washington, D.C.: May 1, 2017).

[65]In regard to smuggling by panga boats and recreational vessels, we recommended the establishment of performance measures and targets for Regional Coordinating Mechanisms. In 2011, DHS established Regional Coordinating Mechanisms to coordinate interagency operations and avoid duplicative efforts to address U.S. mainland threats in the maritime domain, including panga boats and recreational vessels.

measures and monitoring performance against targets, managers could obtain valuable information on successful approaches and areas that could be improved to help ensure that technology investments and operational responses to address these smuggling methods are effective.

DHS agreed with the recommendations for measures related to ultralight aircraft and cross-border tunnels. DHS reported that AMO and Border Patrol have drafted a performance measure for ultralight aircraft, however, reviews and approval of the measure will not be completed until November 2019. As of June 2018, DHS reported that ICE was leading the development of measures related to cross-border tunnels. DHS did not agree with the recommendation to establish measures and monitor performance against targets for smuggling by panga boats and recreational vessels because the department believed measures and targets would not provide the most useful strategic assessment of operations to prevent all illicit trafficking, regardless of area of operations or mode of transportation. We continue to believe that the recommendation is valid and recognize the value of high-level strategic performance measures. However, such high-level measures may not provide sufficiently detailed performance information to allow DHS to identify successful approaches to addressing smuggling by panga boats and recreational vessels and areas for improvement. Further, establishing performance measures and targets related to smuggling by panga boats and recreational vessels could, in turn, better position DHS to understand the overall smuggling threat.

Appendix II provides additional information on these and other metrics we have previously recommended that DHS could use to help measure the effectiveness of border security in the four domains.

Conclusions

Securing U.S. borders is a complex undertaking that spans multiple domains and locations. It is also a key part of DHS's mission for which DHS has made significant investments over the years. Given the complexity and breadth of border security efforts, having data and information available on the state of border security is important for DHS as well as policymakers and the public to understand the effectiveness of those investments. DHS's fiscal year 2017 *Border Security Metrics Report* makes an important contribution in providing such data and information.

DHS components generally have processes to help ensure the reliability of the data used in the metrics report and DHS identified and disclosed some data and methodological limitations with the metrics. However, DHS did not systematically review the reliability of data used in all metrics to identify and disclose limitations and their potential implications for the metric. Without complete information about the limitations of the data or the metric methodologies used in the report, Congress, policymakers, and the public may not be aware of important context or information needed to fully and appropriately understand the data being presented. By developing and implementing a process to systematically review the reliability of the data, as well as comprehensively identify limitations and communicate limitations of the metrics, DHS would improve the quality of the data and information provided in the report which would facilitate a better understanding and appropriate interpretation of the data and information provided.

To develop three metrics in the report, DHS used a statistical model that incorporated untested assumptions about the behavior of unlawful border crossers that may not reflect real-world conditions. DHS was transparent about the limitations of its model, but providing the results of sensitivity analyses and measures of statistical uncertainty related to the model would allow Congress, policymakers, and the public to better understand its potential limitations and more fully evaluate the validity of DHS's metrics that use estimates.

Recommendations for Executive Action

We are making the following four recommendations to DHS:

The Secretary of Homeland Security should develop and implement a process to systematically review the reliability of the data used in its *Border Security Metrics Report* and comprehensively identify any limitations with the data and methodologies that underlie its metrics. (Recommendation 1)

The Secretary of Homeland Security should ensure the communication of the limitations of the metrics identified through the systematic review in the department's annual *Border Security Metrics Report*. (Recommendation 2)

The Under Secretary for the Office of Strategy, Policy, and Plans should include the results of sensitivity analyses to key assumptions in its

statistical models of unlawful entry estimates in its annual *Border Security Metrics Report*. (Recommendation 3)

The Under Secretary for the Office of Strategy, Policy, and Plans should include measures of statistical uncertainty for all metrics based on estimates derived from statistical models in its annual *Border Security Metrics Report*. (Recommendation 4)

Agency Comments

We provided a draft of this report to DHS and the Office of National Drug Control Policy for review and comment. DHS provided written comments, which are reproduced in appendix III and discussed below. DHS also provided technical comments, which we incorporated as appropriate. The Office of National Drug Control Policy indicated via e-mail that it did not have any comments on the draft report.
In its comments, DHS concurred with our recommendations and stated that it planned to implement 3 of the 4 by October 2020. With respect to our second recommendation, DHS requested that we consider it closed as implemented because the department already detailed some of the limitations in its fiscal year 2017 report, and plans to continue to identify known limitations and the progress made to mitigate previously identified limitations in future reports. As discussed in this report, we agree that DHS identified and disclosed limitations for some metrics in its fiscal year 2017 *Border Security Metrics Report*; however, we identified at least one additional limitation for 21 of the 35 metrics on which DHS reported that DHS did not disclose or about which it could have been more transparent. To address the intent of this recommendation, once DHS has implemented a process to systematically review the reliability of the data used in its report and comprehensively identified related limitations, it should disclose those limitations in its annual *Border Security Metrics Report*.

We are sending copies of this report to the appropriate congressional committees and the Secretary of the Department of Homeland Security. In addition, the report is available at no charge on the GAO website at http://www.gao.gov. Contacts points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report.

If you or your staff have any questions about this report, please contact me at (202) 512-8777 or gamblerr@gao.gov. GAO staff who made key contributions to this report are listed in appendix IV.

Rebecca Gambler

Rebecca Gambler, Director
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Appendix I: Additional Information on Metrics Contained in the Department of Homeland Security's Fiscal Year 2017 *Border Security Metrics Report*

This appendix provides additional information on our analysis of the suitability and validity of the metrics the Department of Homeland Security (DHS) reported in its fiscal year 2017 *Border Security Metrics Report* for each of the four domains listed in the National Defense Authorization Act for Fiscal Year 2017 (NDAA)—between ports of entry, at ports of entry, the maritime border, and air and marine metrics in the land domain.[1] Specifically, this appendix provides information on the metrics including their status, descriptions, differences between what DHS reported for the metrics and how they were described or defined by the NDAA, limitations, and any additional information or planned actions by DHS, where applicable.

Between Ports of Entry Domain Metrics

U.S. Border Patrol is the federal agency with the primary responsibility for securing U.S. borders between the designated U.S. land ports of entry including the 6,000 miles of Mexican and Canadian international borders and the 2,000 miles of coastal boundaries surrounding the Florida Peninsula and the island of Puerto Rico. The 14 metrics in this domain measure the number of unlawful border crossers, apprehensions, and illicit drug seizures between ports of entry, among other things. DHS

[1]DHS, *Border Security Metrics Report* (Washington, D.C.: May 1, 2018). DHS intended this report to satisfy the NDAA reporting requirement for fiscal year 2017; therefore, we refer to it as DHS's fiscal year 2017 *Border Security Metrics Report*. Any references to future DHS border security metrics reports are according to the fiscal year DHS intends them to satisfy the NDAA's annual reporting requirement.

included 13 of the 14 metrics called for in the NDAA for this domain in its fiscal year 2017 *Border Security Metrics Report*, as shown in table 4.

Table 4: Status of Metrics in the Between Ports Of Entry Domain in the Department of Homeland Security's (DHS) Fiscal Year 2017 *Border Security Metrics Report*

Metric		Included in the fiscal year 2017 *Border Security Metrics Report*	Not Included in the fiscal year 2017 *Border Security Metrics Report*
1	Attempted unlawful border crosser apprehension rate[a]	yes	
2	Detected unlawful entries[b]	yes	
3	Estimated undetected unlawful entries[c]	yes	
4	Turn backs[d]	yes	
5	Got aways[e]	yes	
6	A measurement of situational awareness achieved in each U.S. Border Patrol sector[f]		yes
7	Unlawful border crossing effectiveness rate[g]	yes	
8	Probability of detection rate[h]	yes	
9	Apprehensions in each U.S. Border Patrol sector[i]	yes	
10	Apprehensions of unaccompanied alien children[j]	yes	
11	Apprehensions of family units[k]	yes	
12	Between the ports illicit drug seizure rate[l]	yes	
13	Estimates of the impact of the Consequence Delivery System on recidivism[m]	yes	
14	Examination of each consequence under the Consequence Delivery System[n]	yes	

Source: GAO analysis of the DHS's fiscal year 2017 *Border Security Metrics Report*. | GAO-19-305

[a]The rate of apprehension of attempted unlawful border crossers. 6 U.S.C. § 223(b)(1)(A)(i).

[b]The number of detected unlawful border crossers. Id. at § 223(b)(1)(A)(ii).

[c]The number of estimated undetected unlawful entries. Id. at § 223(b)(1)(A)(iii).

[d]Id. at § 223(b)(1)(A)(iv).

[e]Id. at § 223(b)(1)(A)(v).

[f]Id. at § 223(b)(1)(B). According to DHS's report, this metric is under development and is estimated to be included in the fiscal year 2020 report.

[g]Unlawful border crossing effectiveness rate in each U.S. Border Patrol sector. Id. at § 223(b)(1)(C).

[h]Id. at § 223(b)(1)(D).

[i]The number of apprehensions in each U.S. Border Patrol sector. Id. at § 223(b)(1)(E).

[j]The number of apprehensions of unaccompanied alien children, and the nationality of such children in each U.S. Border Patrol sector. Id. at § 223(b)(1)(F).

[k]The number of apprehensions of family units, and the nationality of such family units in each U.S. Border Patrol sector. Id. at § 223(b)(1)(G).

[l]An illicit drugs seizure rate for drugs seized by U.S. Border Patrol between ports of entry. Id. at § 223(b)(1)(H).

[m]Estimates of the impact of the Consequence Delivery System on recidivism of unlawful border crossers over multiple fiscal years. Id. at § 223(b)(1)(I).

[n]Id. at § 223(b)(1)(J).

DHS reported that the "measurement of situational awareness achieved in each U.S. Border Patrol sector" metric—the one metric on which it did not provide information in the between ports of entry domain—was under development and estimated that it would provide information on this metric in its 2020 annual report to Congress.

Table 5: Status of Metrics for Securing the Border at Ports of Entry in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report

Table 6: Status of Metrics for Securing the Maritime Border in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report

Table 7: Status of Air and Marine Security Metrics in the Land Domain in the Department of Homeland Security's (DHS) Fiscal Year 2017 Border Security Metrics Report

Appendix II: Other Metrics the Department of Homeland Security Could Use to Measure the Effectiveness of Border Security

Based on findings from previous reviews of border security programs and efforts, we have recommended other metrics that the Department of Homeland Security (DHS) could use to help measure the effectiveness of border security. The tables that follow provide information about these recommended metrics in each of the four domains listed in the National Defense Authorization Act for Fiscal Year 2017—between ports of entry, at ports of entry, in the maritime border domain, and the air and marine security in the land domain. The recommendations listed in the tables below remain open; however, implementing them would provide DHS with additional indicators and metrics that could provide important insights into the state of border security.

Table 8: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security Between Ports of Entry

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
Southwest Border Security: Additional Actions Needed to Better Assess Fencing's Contributions to Operations and Provide Guidance for Identifying Capability Gaps (GAO-17-331)	In February 2017, we reported on the use of border fencing along the southwest border. We found that, among other things, U.S. Border Patrol (Border Patrol) collects data that could be useful to assess the contributions of border fencing to border security operations, but had not conducted such an assessment.	Border Patrol should develop metrics to assess the contributions of pedestrian and vehicle fencing to border security along the southwest border using the data Border Patrol already collects and apply this information, as appropriate, when making investment and resource allocation decisions.	DHS agreed with the recommendation and reported that Border Patrol planned to develop and incorporate metrics into its operational control framework for southwest border security operations. As of October 2018, Border Patrol planned to test the metrics and implement them in the framework by September 2019.To fully implement this recommendation, Border Patrol should complete its efforts to develop metrics for assessing the contributions of pedestrian and vehicle fencing to border security operations and apply these metrics when making resource allocation decisions.
Arizona Border Surveillance Technology Plan: Additional Actions Needed to Strengthen Management and Assess Effectiveness (GAO-14-368)[a]	In March 2014, we reported on the status of DHS's Arizona Border Surveillance Plan—a plan for security technology deployment across the Arizona border which includes a mix of radars, sensors, and cameras to help provide security for the Arizona border. We found that while U.S. Customs and Border Protection (CBP) defined mission benefits for the technology programs under the Plan, the agency did not develop key attributes for performance metrics for all surveillance technologies to be deployed as part of the Plan.	CBP should analyze available data on apprehensions and seizures and technological assists, in combination with other relevant performance metrics or indicators, as appropriate, to determine the contribution of surveillance technologies to CBP's border security efforts.	CBP agreed with the recommendation and in May 2017, Border Patrol officials demonstrated a new system, intended to allow for more comprehensive analysis of the contributions of surveillance technologies to Border Patrol's mission. In July 2018 Border Patrol distributed a report to its leadership that included, among other things, the proportion of apprehensions in which certain surveillance technologies were utilized during the first three quarters of fiscal year 2018. However, according to Border Patrol officials, some of the data in the report were not reliable due to data entry errors. Border Patrol officials stated they have plans for training, system integration, and additional steps intended to improve data entry and reporting consistency by the first quarter of fiscal year 2020.

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
Arizona Border Surveillance Technology: More Information on Plans and Costs Is Needed before Proceeding (GAO-12-22)[a]	In November 2011, we reported on CBP's plans for developing and implementing a new approach for using surveillance technology (Arizona Border Surveillance Technology Plan) along the southwest border in Arizona. We found that CBP did not have the information needed to fully support and implement the Plan in accordance with DHS and Office of Management and Budget guidance. Further, we found that CBP had not defined the mission benefits expected from implementing the new Plan. We concluded that defining the expected benefits could help improve CBP's ability to assess the effectiveness of the Plan.	CBP should determine the mission benefits to be derived from implementation of the Arizona Border Surveillance Technology Plan and develop and apply key attributes for metrics to assess program implementation.	DHS agreed with the recommendation and the Border Patrol has made some progress in identifying key attributes for metrics to assess implementation of the Plan, such as the proportion of apprehensions in which certain technologies were utilized, but it has not yet fully assessed implementation of the Plan. In December 2018, Border Patrol officials stated they planned to meet in early 2019 to discuss additional actions to ensure they have access to and are using performance information about existing technologies as they make decisions about future resource investments in additional or new technologies.
Border Patrol: Checkpoints Contribute to Border Patrol's Mission, but More Consistent Data Collection and Performance Measurement Could Improve Effectiveness (GAO-09-824)[b]	In August 2009, we reported on the contributions and impact of checkpoints along the southwest border. We found that Border Patrol had identified some measures to evaluate the impact checkpoints have on local communities in terms of quality of life, but Border Patrol had not implemented the measures. As a result, Border Patrol lacked information on how checkpoint operations could affect nearby communities.	CBP should implement quality of life measures that have already been identified by Border Patrol to evaluate the impact checkpoints have on local communities. Implementing these measures would include identifying appropriate data sources available at the local, state, or federal level, and developing guidance for how data should be collected and used in support of these measures.	CBP agreed with the recommendation. In June 2018, Border Patrol reported that its Checkpoint Program Management Office is making progress identifying and implementing such performance measures, and Border Patrol expects to fully implement the measures by September 2019.

Source: GAO analysis of GAO reports related to border security. | GAO-19-305

[a]We recently updated our work on this topic, see GAO, *Southwest Border Security: Border Patrol Is Deploying Surveillance Technologies but Needs to Improve Data Quality and Assess Effectiveness*, GAO-18-119, (Washington, D.C.: Nov. 30, 2017).

[b]We recently updated our work on this topic, see GAO, *Border Patrol: Issues Related to Agent Deployment Strategy and Immigration Checkpoints*, GAO-18-50, (Washington, D.C.: Nov. 8, 2017).

Table 9: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security At Ports of Entry

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
U.S. Ports of Entry: CBP Public-Private Partnership Programs Have Benefits, but CBP Could Strengthen Evaluation Efforts (GAO-18-268)	In March 2018, we reported on the agreements, funds, and donations that U.S. Customs and Border Protection's (CBP) and General Services Administration have received under the Reimbursable Services Program (RSP) and Donations Acceptance Program (DAP).[a] We found that CBP uses various processes to monitor and evaluate its partnerships, but could benefit from establishing an evaluation plan to assess overall program performance. We concluded that given CBP's staffing challenges and anticipated growth of the RSP and DAP, an evaluation plan could better position CBP to further integrate evaluation activities into program management.	CBP should develop and implement an evaluation plan to be used to assess the overall performance of the RSP and DAP, which could include, among other things, measurable objectives, performance criteria, evaluation methodologies, and data collection plans to inform future program decisions.	CBP agreed with this recommendation and noted that it would take steps to implement it. As of December 2018, CBP developed and is implementing an evaluation plan to assess the overall performance of the RSP and DAP. CBP plans to issue an internal report on its evaluation in April 2019, and thereafter, on an annual basis.
Supply Chain Security: CBP Needs to Enforce Compliance and Assess the Effectiveness of the Importer Security Filing and Additional Carrier Requirements (GAO-17-650)	In July 2017, we reported on CBP's implementation of its Importer Security Filing (ISF) program related to compliance, enforcement, and performance. We found that the ISF rule data have improved CBP's ability to identify high-risk cargo shipments, but CBP could collect additional performance information to better evaluate program effectiveness.[b]	CBP should identify and collect additional performance information on the impact of the ISF rule data, such as the identification of shipments containing contraband, to better evaluate the effectiveness of the ISF program.	CBP agreed with the recommendation. In June 2018, CBP reported that CBP staff continue to work on additional performance metrics to evaluate the effectiveness of the ISF program, and are analyzing data to identify, among other things, the number of unmanifested containers and how or if they were mitigated before arrival. In February 2019, CBP reported that implementation of the recommendation is ongoing and it expects to complete this work by December 2019.

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
Border Security: CBP Aims to Prevent High-Risk Travelers from Boarding U.S.-Bound Flights, but Needs to Evaluate Program Performance (GAO-17-216)	In January 2017, we reported on CBP's air predeparture programs—programs designed to interdict high-risk individuals, such as potential terrorists, human traffickers, drug smugglers, and otherwise inadmissible persons, before they board U.S.-bound aircraft—and CBP's plans to expand them. We found that while CBP's predeparture programs have helped identify and interdict high-risk travelers, CBP had not fully evaluated the overall effectiveness of these programs using performance measures and baselines. CBP tracked some data, such as the number of travelers deemed inadmissible, but had not set baselines to determine if predeparture programs are achieving goals. By developing and implementing a system of performance measures and baselines, CBP would be better positioned to assess if the programs are achieving their goals.	CBP should develop and implement a system of performance measures and baselines to evaluate the effectiveness of CBP's predeparture programs and assess whether the programs are achieving their stated goals.	CBP agreed with the recommendation and the CBP Office of Field Operations reported that it established a working group to develop and implement a system of performance measures and baselines to evaluate the effectiveness of CBP's predeparture programs. As of July 2017, CBP reported that the working group had developed three performance measures for its predeparture programs. At that time, according to Office of Field Operations officials, they expected fiscal year 2018 to be the first complete year that each of these measures is calculated and used as the baseline year for future program assessments.

Source: GAO analysis of GAO reports related to border security. | GAO-19-305

[a]Under the Reimbursable Services Program, partners reimburse CBP for providing services that exceed CBP's normal operations, such as paying overtime for CBP personnel that provide services at ports of entry outside normal business hours. The Donations Acceptance Program enables partners such as local municipalities to donate property or provide funding for port of entry infrastructure improvements.

[b]In January 2009, CBP implemented the ISF and Additional Carrier Requirements, generally referred to as the ISF rule. *Importer Security Filing and Additional Carrier Requirements, 73 Fed. Reg. 71,730 (Nov. 25, 2008) (codified at 19 C.F.R. pts. 4, 12, 18, 101, 103, 113, 122, 123, 141, 143, 149, 178, & 192*).The ISF rule requires that importers (who order containerized and break bulk goods—commodities such as bound lumber or goods stacked on wooden pallets—to be shipped from foreign sources to the United States via oceangoing vessels) and vessel carriers (who physically transport goods from foreign ports to ports in the United States) submit additional cargo information, such as country of origin, to CBP before the cargo is loaded onto U.S.-bound vessels. See 19 C.F.R. §§ 4.7c, 4.7d, 149.1-149.6.

Table 10: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Border Security in the Maritime Border Domain

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
Coast Guard: Actions Needed to Enhance Performance Information Transparency and Monitoring (GAO-18-13)	In October 2017, we reported on the U.S. Coast Guard's (Coast Guard) performance goals. We found that although the Coast Guard's performance goals are generally aligned with its statutory missions, the Coast Guard did not explain why certain aspects of mission performance are measured while others are not. We concluded that in the absence of documentation explaining how existing performance goals address each mission, it is unclear the extent to which the Coast Guard's performance goals encompass all of its mission activities.	Coast Guard should either develop new performance goals to address mission activity gaps, or explain in the Coast Guard's Annual Performance Report (APR) why certain aspects of mission performance are measured while others are not.	In October 2017, the Coast Guard agreed with the recommendation and stated that it would add new measures in future APRs and explain what is measured and what is not, as appropriate. In February 2018, the Coast Guard provided us with its updated fiscal year 2017 APR. We found that the updated APR explained why the Coast Guard's two performance goals related to its drug interdiction mission focus only on cocaine interdiction. However, the updated APR did not include additional goals or explain why certain aspects of mission performance were not measured for the four other performance goals we previously identified as not fully addressing all related mission activities. In order to fully implement our recommendation as intended, in instances in which performance goals do not fully address all of the respective mission activities, the Coast Guard's APR should explain the Coast Guard's rationale for why certain aspects of mission performance are measured while others are not.

Source: GAO analysis of GAO report related to border security. | GAO-19-305

Table 11: Other Metrics the Department of Homeland Security (DHS) Could Use to Measure the Effectiveness of Air and Marine Border Security in the Land Domain

Product title and number	Summary and finding	Recommended metric	Status of recommendation implementation
Border Security: Additional Actions Could Strengthen DHS Efforts to Address Subterranean, Aerial, and Maritime Smuggling (GAO-17-474)[a]	In May 2017, we reported on DHS's efforts to address threats posed by smuggling in the aerial, subterranean, and maritime environments. We found that DHS components collected various data regarding the prevalence of smuggling using ultralight aircraft, cross-border tunnels, and selected maritime smuggling methods, but had not established performance measures and associated targets to assess the effectiveness of their efforts specific to addressing these threats.	DHS should establish and monitor performance measures and targets related to • ultralight aircraft; • cross-border tunnels; and • panga boat (a fishing vessel) and recreational vessel smuggling.	**Ultralight aircraft smuggling.** DHS agreed with our recommendation related to ultralight aircraft. As of June 2018, U.S. Customs and Border Protection (CBP) reported that Air and Marine Operations and the U.S. Border Patrol drafted a performance measure and that CBP expects that reviews and approval of the measure will be completed by November 2019. **Cross-border tunnel smuggling.** DHS agreed with our recommendation related to cross-border tunnels. As of June 2018, CBP reported that U.S. Immigration and Customs Enforcement (ICE) was taking the lead on developing measures related to cross-border tunnels. **Panga boats and recreational vessel smuggling.** DHS did not agree with our recommendation. DHS stated that it did not believe that performance measures and targets related to smuggling by panga boats would provide the most useful strategic assessment of operations to prevent all illicit trafficking. DHS stated that its Office of Policy, Strategy, and Plans is to work with the U.S. Coast Guard, CBP, and ICE, among others, to better evaluate the effectiveness of all operations that work to prevent the illegal entry of goods and people into the country, as appropriate. We continue to believe that the recommendation is valid and will monitor DHS's efforts to address it.

Source: GAO analysis of GAO report related to border security. | GAO-19-305

[a]In addition to smuggling using ultralight aircraft in the air and marine domain, this work addressed smuggling methods relevant to other domains including cross-border tunnel smuggling which is related to between ports of entry domain, and panga boats and recreational vessels smuggling related to the maritime domain.

Appendix III: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

March 7, 2019

Rebecca Gambler
Director, Homeland Security and Justice
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report GAO-19-305, "BORDER SECURITY: DHS Should Improve the Quality of Unlawful Border Entry Information and Other Metric Reporting"

Dear Ms. Gambler:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO's recognition that (1) securing U.S. borders is a complex undertaking for which DHS has made significant investments over the years, (2) having data and information available on the state of border security is important for stakeholders to understand the effectiveness of those investments, and (3) DHS's fiscal year (FY) 2017 "Border Security Metrics Report" (BMSR) makes an important contribution in providing such data and information.

We also note that several limitations GAO identified in the FY 2017 BSMR are already being addressed in the FY 2018 BMSR, which is expected to be released by March 29, 2019. For example, the FY 2018 report will include data on "northern and coastal border apprehensions, including apprehensions of family units and unaccompanied children." The report will also include an estimate of unknown major infractions at ports of entry using Compliance Examination Program data. In addition, as a result of a working group led by the DHS Office of Strategy, Policy, and Plans (PLCY) Office of Immigration Statistics (OIS), with U.S. Customs and Border Protection (CBP) and the United States Coast Guard (USCG), two additional metrics in the maritime domain not addressed in the FY 2017 and FY 2018 reports are on track to be included in the FY 2019 report.

The draft report contained four recommendations with which the Department concurs. Attached find our detailed response to each recommendation. Technical comments were previously provided under separate cover.

Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

2

Attachment: Management Response to Recommendations Contained in GAO 19-305

GAO recommended that:

Recommendation 1: The Secretary of Homeland Security should develop and implement a process to systematically review the reliability of the data used in its *Border Security Metrics Report* metrics and comprehensively identify any limitation with the data and methodologies that underlie its metrics.

Response: Concur. DHS PLCY will work with operational Components (i.e., CBP and USCG) to review the reliability of statistical data derived from operational systems. Given the scope of data collection efforts identified in the BMSR, this review may take until the end of FY 2020 to complete. Estimated Completion Date (ECD): September 30, 2020.

Recommendation 2: The Secretary of Homeland Security should ensure the communication of the limitations of the metrics identified through the systemic review in the department's annual *Border Security Metrics Report.*

Response: Concur. DHS PLCY OIS has already included a detailed discussion of known limitations in the FY 2017 BMSR, and will continue to identify known limitations as well as any progress made to mitigate previously identified limitations in all subsequent versions of the report (to be released annually). We request that GAO consider this recommendation resolved and closed as implemented.

Recommendation 3: The Under Secretary for the Office of Strategy, Policy, and Plans should include the results of sensitivity analyses to key assumptions in its statistical models of unlawful entry estimates in its annual *Border Security Metrics Report.*

Response: Concur. DHS PLCY OIS will continues its effort to conduct a sensitivity analysis for the FY 2020 BMSR and will include results in the report, as appropriate. ECD: September 30, 2020.

Recommendation 4: The Under Secretary for the Office of Strategy, Policy, and Plans should include measures of statistical uncertainty for all metrics based on estimates derived from statistical models in its annual Border Security Metrics Report.

Response: Concur. DHS PLCY OIS will continue its effort to estimate statistical uncertainty for the FY 2020 BMSR and will include results in the report, as appropriate. ECD: September 30, 2020.

3

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Rebecca Gambler, (202) 512-8777 or gamblerr@gao.gov

Staff Acknowledgments

In addition to the contact named above, Taylor Matheson (Assistant Director), David Alexander, Kelsey Burdick, Lilia Chaidez, Kathleen Donovan, Michele Fejfar, Sally Gilley, Christopher Hatscher, Eric Hauswirth, Mikaela Meyer, Sasan J. “Jon” Najmi, Kevin Reeves, and Jeff Tessin made key contributions to this report.

Appendix V: Accessible Data

Data Tables

Accessible Data for Figure 3: Apprehensions Reflected in the Department of Homeland Security's Statistical Analysis to Estimate Undetected Unlawful Entries

Fiscal year	Percentage
2000	65.4199
2001	72.9247
2002	71.109
2003	71.8674
2004	70.5156
2005	64.6797
2006	68.2388
2007	68.8035
2008	66.6307
2009	62.1569
2010	56.0566
2011	48.9673
2012	40.9002
2013	35.3536
2014	23.1565
2015	25.3048
2016	21.8493

Accessible Data for Figure 4: Individuals Apprehended at the Border Who Are Not Included in the Department of Homeland Security's (DHS) Model-based Apprehension Rate

n/a	Percentage				
Fiscal year	In Immigration Court Proceedings in the United States	Non-Mexicans	Other Individuals DHS Believes May Seek Asylum (e.g. Families)	Unaccompanied Minors	Individuals Who Are Seeking Aslyum
2000	26.331	1.38	0.3	0.001	
2001	20.893	1.842	0.3	0.001	
2002	23.42	2.354	0.5	0.003	

n/a	Percentage				
Fiscal year	In Immigration Court Proceedings in the United States	Non-Mexicans	Other Individuals DHS Believes May Seek Asylum (e.g. Families)	Unaccompanied Minors	Individuals Who Are Seeking Aslyum
2003	22.985	3.454	0.8	0.003	
2004	24.552	4.768	1.1	0.004	0.002325
2005	29.936	12.371	2.2	0.003	0.426229
2006	26.464	8.087	2	0.343	0.132165
2007	26.474	5.998	2.1	0.688	0.176661
2008	29.398	6.588	2.2	0.891	0.25188
2009	33.922	7.13	3.2	3.105	0.394573
2010	39.8	9.974	4.1	3.528	0.868552
2011	46.091	13.329	6.4	4.462	1.49247
2012	53.744	24.32	10.1	6.255	1.57953
2013	58.886	34.071	15.7	8.657	3.67722
2014	66.492	50.595	35.2	13.827	4.91689
2015	65.142	43.437	36	10.476	7.15916
2016	69.554	54.982	47.5	12.472	13.0876

Agency Comment Letter

Accessible Text for Appendix III Comments from the Department of Homeland Security

Page 1

March 7, 2019

Rebecca Gambler

Director, Homeland Security and Justice

U.S. Government Accountability Office

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Washington, DC 20548

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