



DEPARTMENT OF VETERANS AFFAIRS
OFFICE OF INSPECTOR GENERAL

Office of Audits and Evaluations

DEPARTMENT OF VETERANS AFFAIRS

Unreliable Information
Technology Infrastructure
Cost Estimates for the
Electronic Health Record
Modernization Program

AUDIT

REPORT #20-03185-151

JULY 7, 2021



MISSION

The mission of the Office of Inspector General is to serve veterans and the public by conducting meaningful independent oversight of the Department of Veterans Affairs.

In addition to general privacy laws that govern release of medical information, disclosure of certain veteran health or other private information may be prohibited by various federal statutes including, but not limited to, 38 U.S.C. §§ 5701, 5705, and 7332, absent an exemption or other specified circumstances. As mandated by law, the OIG adheres to privacy and confidentiality laws and regulations protecting veteran health or other private information in this report.

**Report suspected wrongdoing in VA programs and operations
to the VA OIG Hotline:**

www.va.gov/oig/hotline

1-800-488-8244



Executive Summary

VA is nearly three years into a 10-year modernization effort to replace its aging electronic health record system. The new system is designed to be interoperable with the Department of Defense's system, which will allow healthcare providers to access more comprehensive medical histories for the more than nine million veterans enrolled in the VA healthcare program. The Electronic Health Record Modernization (EHRM) program manages VA's transition to the new system.

In 2018, VA reported to Congress that the program would cost approximately \$16.1 billion over 10 years to implement the new system across VA facilities nationwide.¹ This cost included about \$4.3 billion for information technology (IT) infrastructure upgrades. These upgrades include system interfaces and updates to end-user devices like desktop and laptop computers.² These upgrades are critical to successful deployment of the new system. Reporting reliable cost estimates for these upgrades is imperative so that Congress has the information needed to make informed budgetary and investment decisions. Within VA, senior leaders depend on cost estimates to plan program budgets, make acquisitions, and monitor program execution. For these reasons, VA should make certain cost estimates are reliable and all program-related costs are reported to achieve program success.

Because of the extensive costs to taxpayers and the importance of the EHRM program to providing veterans with quality care, the VA Office of Inspector General (OIG) conducted this audit as part of its oversight of this complex modernization program. This is the second OIG report this year examining VA's development and reporting of cost estimates for infrastructure upgrades needed to support the EHRM program.³ This audit examines whether the Office of Electronic Health Record Modernization (OEHRM) developed IT infrastructure upgrade cost estimates that were well-documented, comprehensive, credible, and accurate in accordance with VA standards and Government Accountability Office (GAO) guidance. The OIG also examined whether OEHRM reported to Congress all IT infrastructure upgrade costs needed to support the program, including future technology refreshment.⁴

¹ *Hearing on 180-Day Review of the Electronic Health Record Modernization Program, Before the Subcommittee on Technology Modernization, US House Committee on Veterans' Affairs, 115th Cong.* (November 14, 2018).

² These IT infrastructure upgrades are distinct from physical infrastructure upgrades such as cabling, wiring, heating, cooling, and other improvements. See VA OIG, *Deficiencies in Infrastructure Readiness for Deploying VA's New Electronic Health Record System*, Report No. 19-08980-95, April 27, 2020.

³ The first OIG report noted deficiencies in reporting the full associated costs to Congress on physical infrastructure costs, funded by the Veterans Health Administration. See VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*, Report No. 20-03178-116, May 25, 2021.

⁴ Technology refreshment is the process of replacing certain infrastructure on a regular schedule, instead of using the systems or devices until they can no longer function. For example, end-user devices such as desktop and laptop computers are replaced routinely every four years.

What the Audit Found

This report identified weaknesses in how OEHRM developed and reported the cost estimates for IT infrastructure upgrades needed to support the new electronic health record system.⁵ The OIG found that the estimate of about \$4.3 billion was not reliable, and a lack of complete documentation made it difficult to determine the accuracy of estimates, in itself a problem. Furthermore, the OIG determined that VA did not report to Congress other, critical program-related IT infrastructure upgrade costs totaling about \$2.5 billion, thus underreporting the program life-cycle costs by a significant amount. This lapse in reliable reporting occurred because certain IT infrastructure upgrade costs are assumed by VA's Office of Information and Technology (OIT) and the Veterans Health Administration (VHA), and there were inadequate procedures for determining if a cost-estimate update is needed in the office's congressionally mandated reports and, if so, when this update should occur. The sections below describe in more detail the findings of this report.

IT Infrastructure Upgrade Cost Estimates Were Not Reliable

The OIG found that OEHRM's cost estimates for the IT infrastructure upgrades did not fully meet reliable cost-estimate criteria. VA standards and GAO cost-estimating guidance state that reliable estimates should be well-documented, comprehensive, credible, and accurate. The audit team evaluated two estimates OEHRM provided to Congress dated December 2018 and August 2020—each for about \$4.3 billion. Neither of the estimates fully met the characteristics of being well-documented, comprehensive, and credible. The team could not thoroughly evaluate the two estimates for accuracy because they lacked sufficient documentation to support many of the calculations. Furthermore, OEHRM itself identified weaknesses similar to those identified by the audit team for nine of 12 IT infrastructure cost categories in the August 2020 cost estimate.

Several factors contributed to the lack of reliable estimates, including that VA did not complete an independent cost estimate as required by VA financial policy.⁶ An independent cost estimate is a complete and fully documented estimate developed independent of the program office. This control is used to test the reasonableness of the program cost estimate. It is likely that an independent cost estimate would have revealed many of the issues found during this audit and allowed OEHRM to take earlier action to improve the reliability of its estimates.

The lack of reliable cost estimates was also caused, in part, by OEHRM staff prioritizing competing demands. Furthermore, OEHRM lacked procedures for staff to follow when developing these estimates. Such procedures could have helped ensure consistency and compliance with VA standards and cost-estimating guidance.

⁵ Some information provided to support the December 2018 cost estimate was developed by VA prior to the June 2018 establishment of OEHRM.

⁶ VA Financial Policy, vol. III, chap. 12, "Life Cycle Cost Estimating," May 4, 2017.

OEHRM Began Making Improvements to Cost Estimates

OEHRM's August 2020 estimate was supported by significantly more details than the initial estimate. Despite these improvements, the estimate was still not well-documented. In January 2021, in part due to discussions with the audit team, OEHRM began developing procedures for staff to follow that align with cost-estimating guidance and include controls to help address the issues identified in this report. During the audit, the team noted that the office also began making improvements to the cost model used to develop the estimate, facilitating the development and maintenance of more detailed support. Along with the development of procedures, the cost model modification will likely improve the reliability of future cost estimates for IT infrastructure.

IT Infrastructure Costs Were Omitted and Not Updated for Accuracy

The OIG found OEHRM did not include costs for critical program-related IT infrastructure upgrades in the estimates reported to Congress, effectively underreporting program costs by nearly \$2.5 billion. The Veterans Benefits and Transition Act of 2018 requires the VA Secretary to submit quarterly reports that include life-cycle cost estimates to Congress.⁷ The \$2.5 billion in costs are for IT infrastructure upgrades that two distinct entities are expected to fund: VA's OIT and VHA.⁸ OEHRM officials stated they believed the omitted costs were outside the office's scope of responsibility for reporting, but neither OIT nor VHA had themselves reported these costs to Congress. VA and GAO guidance requires that a life-cycle cost estimate include *all costs, regardless of funding source*.⁹ Therefore, these costs should have been disclosed as part of the program life-cycle cost estimate reported to Congress.

The OIG found there is an increased risk of insufficient funding to complete the upgrades because OEHRM lacks formal agreements with OIT and VHA to commit these entities to funding the \$2.5 billion in upgrades OEHRM expects them to contribute. Although there was a general understanding that OIT and VHA will pay for some IT infrastructure upgrades necessary to deploying and sustaining the new electronic health record system, establishing formal agreements would help clarify who will fund the upgrades and reduce the risk that OEHRM may need to incur these costs if OIT and VHA are unable to fund those upgrades.

⁷ Veterans Benefits and Transition Act of 2018, Pub. L. No. 115-407 § 503 (2018). The act defines the EHRM program as "any activities ... to procure or implement an electronic health or medical record system to replace" the existing electronic health record system and "any contracts or agreements entered into by [VA] to carry out, support, or analyze" these activities.

⁸ OIT is expected to fund some upgrades for the local area network, end-user devices, phones, and Wi-Fi, while VHA is expected to fund upgrades mostly for medical devices.

⁹ *VA Cost Estimating Guide*, ver. 2.2, August 17, 2016; GAO, *Cost Estimating and Assessment Guide*, GAO-09-3SP, March 2009, and GAO-20-195G, March 2020.

OEHRM also did not present IT infrastructure cost estimate updates affecting future years in reports submitted to Congress. In February 2020, OEHRM knew of changes to fiscal year 2021 costs requiring revisions to expected annual costs but did not update the life-cycle cost estimate in any of the four subsequent congressionally mandated reports.

In August 2020, nearly six months after these changes were known, OEHRM finally briefed Congress, at the request of lawmakers, with an updated life-cycle cost estimate that reflected changes to expected costs for IT infrastructure upgrades in fiscal years 2021 through 2027. As of January 2021, OEHRM had yet to update the life-cycle cost estimate in the program's two subsequent congressionally mandated reports. This is contrary to both the act, which requires quarterly program updates on annual costs, and VA financial policy, which states that life-cycle cost estimates should be regularly updated to reflect the current status of the program.¹⁰

This lapse in accurate reporting occurred because OEHRM has not established procedures to assist staff in determining if a cost-estimate update is needed in the program's congressionally mandated reports and, if so, when this update should occur. Instead, staff relied on unclear internal guidance. Without all critical IT infrastructure upgrade costs accurately presented in the life-cycle cost estimates, Congress lacks a comprehensive picture of total program costs that decision makers need to make informed oversight and investment decisions.

What the OIG Recommended

The OIG made six recommendations for OEHRM's executive director to (1) ensure an independent cost estimate is performed, (2) reassess the cost estimate for program-related IT infrastructure upgrades and refine it as needed to comply with cost-estimating standards, (3) develop procedures that align with VA cost-estimating guidance, (4) ensure costs for all IT infrastructure upgrades needed for the program and funded by OIT and VHA or other sources are disclosed in program life-cycle cost estimates presented to Congress, (5) formalize agreements with OIT and VHA to identify the expected funding contributions from each entity, and (6) establish procedures that identify when life-cycle cost estimates should be updated and ensure those updates are disclosed in the program's congressionally mandated reports.

Management Comments and OIG Response

OEHRM's executive director concurred with the six recommendations and provided action plans to address all; however, the OIG feels the action plan for recommendation 6 only partially meets the intent of the recommendation as the response does not address how VA will ensure updated estimates are disclosed in the program's congressionally mandated reports. The OIG reiterates the importance of OEHRM taking corrective actions to address this recommendation to help

¹⁰ Veterans Benefits and Transition Act of 2018, Pub. L. No. 115-407 § 503 (2018); VA Financial Policy, "Life Cycle Cost Estimating."

ensure the department meets the intent of statutory and policy requirements and provides Congress relevant information.

OEHRM did not provide target completion dates for the action plans but stated they would be provided as soon as information becomes available. The OIG will continue to monitor VA's progress in addressing its findings and recommendations, and the recommendations will be considered open until VA has provided sufficient evidence to demonstrate corrective actions have been implemented. VA also provided technical comments on the report. Appendix C contains the full text of VA's response.



LARRY M. REINKEMEYER
Assistant Inspector General
for Audits and Evaluations

Contents

Executive Summary	i
Abbreviations	vii
Introduction.....	1
Results and Recommendations	5
Finding 1: OEHRM’s IT Infrastructure Upgrade Cost Estimates Were Unreliable but Process Improvements Were Made.....	5
Finding 1 Conclusion	12
Recommendations 1–3	13
Finding 2: OEHRM Did Not Include All IT Infrastructure Upgrade Cost Estimates or Accurately Present Yearly Estimates in Congressionally Mandated Reports ..	15
Finding 2 Conclusion	21
Recommendations 4–6	21
Appendix A: Background	24
Appendix B: Scope and Methodology	26
Appendix C: Management Comments.....	31
OIG Contact and Staff Acknowledgments	35
Report Distribution	36

Abbreviations

DoD	Department of Defense
EHRM	Electronic Health Record Modernization
FY	fiscal year
GAO	Government Accountability Office
IT	information technology
LCCE	life-cycle cost estimate
OEHRM	Office of Electronic Health Record Modernization
OIG	Office of Inspector General
OIT	Office of Information and Technology
PAE	Office of Programming, Analysis and Evaluation
VHA	Veterans Health Administration



Introduction

In this report, the Office of Inspector General (OIG) examines VA's reporting of cost estimates for information technology (IT) infrastructure upgrades related to its 10-year Electronic Health Record Modernization (EHRM) effort. This modernization effort will replace VA's aging electronic health record system (the Veterans Health Information Systems and Technology Architecture) with a new system intended to share the same commercial software platform and data-hosting environment as the Department of Defense (DoD)'s system. VA thus expects to provide a single common system that will result in a comprehensive, lifetime health record for military service members. The estimated total program cost for EHRM is approximately \$16.1 billion, divided into three components:

- The EHRM contract to Cerner Government Services, awarded in May 2018, is to replace VA's electronic health record system at a cost of about \$10 billion.
- Infrastructure upgrades needed to support the new electronic health record system are expected to cost about \$4.3 billion.¹¹
- Program management and oversight to enable successful implementation of the new system is expected to cost about \$1.8 billion.

To support successful system deployment, significant IT infrastructure upgrades must occur at facilities nationwide.¹² IT infrastructure is defined as all IT investments that support common systems, communications, and computing infrastructure.¹³ These investments include local area networks, interfaces, and desktop computers. The Office of Electronic Health Record Modernization (OEHRM) is generally responsible for developing estimates for and funding these types of upgrades.

Because of the extensive costs to taxpayers and the importance of the EHRM program to providing veterans with quality care, the OIG conducted this audit as part of its oversight of this complex modernization program. The OIG initiated this audit to determine whether VA developed and reported reliable life-cycle cost estimates (LCCEs) for IT infrastructure upgrades needed to support the new electronic health record system. Specifically, the audit team examined whether OEHRM developed IT infrastructure upgrade cost estimates that were well-documented,

¹¹ As developed in this report, the \$4.3 billion figure does not include certain costs of IT infrastructure upgrades, and as stated in a prior OIG report, also does not include the costs of physical infrastructure upgrades needed to support the EHRM program. See VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*, Report No. 20-03178-116, May 25, 2021.

¹² These IT infrastructure investments differ from physical infrastructure such as cabling, wiring, heating, cooling, and other upgrades discussed in VA OIG, *Deficiencies in Infrastructure Readiness for Deploying VA's New Electronic Health Record System*, Report No. 19-08980-95, April 27, 2020.

¹³ VA Directive 6008, *Acquisition and Management of VA Information Technology Resources*, November 2, 2017.

comprehensive, credible, and accurate in accordance with VA standards and Government Accountability Office (GAO) guidance. The team also assessed whether OEHRM reported to Congress all costs associated with IT infrastructure upgrades needed to support the program, including future technology refreshment.¹⁴

This is the second OIG report this year to examine VA’s development and reporting of reliable cost estimates. The first, published in May 2021, focused on deficiencies in fully reporting to Congress estimates for physical infrastructure upgrades such as electrical work and environment controls.¹⁵ The Veterans Health Administration (VHA) develops estimates for and funds physical infrastructure upgrades.

Similarly, past reports issued by GAO and the VA OIG found VA’s previous cost estimates for other construction and IT projects were not reliable.¹⁶ Given the EHRM program costs in the billions of dollars and the importance of this modernization effort to veteran care, developing a reliable program LCCE and reporting all necessary program costs is imperative to achieve program success. All stakeholders should have the information needed to make informed budgetary, investment, and management decisions.

Life-Cycle Cost Estimates

According to VA policy, an LCCE includes all costs incurred during the total life of a system, from program initiation through termination.¹⁷ It provides an exhaustive accounting of all resources required to deploy a particular program and thus “encompasses all past (or sunk), present, and future costs for every aspect of a program, regardless of funding source.”¹⁸

VA financial policy requires the development of an LCCE for all VA Secretary-priority programs, which would include EHRM. The Veterans Benefits and Transition Act of 2018 requires the VA Secretary to report the annual and life-cycle cost estimates of the EHRM

¹⁴ Technology refreshment is the process of replacing certain infrastructure on a regular schedule, instead of using the systems or devices until they can no longer function. For example, end-user devices such as desktop and laptop computers are replaced routinely every four years.

¹⁵ VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*.

¹⁶ GAO, *VA is Working to Improve Initial Project Cost Estimates, but Should Analyze Costs and Schedule Risks*, GAO-10-189, December 2009; GAO, *Agencies Need to Address Significant Weakness in Policies and Practices*, GAO-12-629, July 2012; VA OIG, *Audit of the Non-Recurring Maintenance Program*, Report No. 13-00589-137, May 7, 2014; GAO, *Management of Minor Construction and Non-Recurring Maintenance Programs Could Be Improved*, GAO-18-479, July 2018.

¹⁷ VA Financial Policy, vol. III, chap. 12, “Life Cycle Cost Estimating,” May 4, 2017.

¹⁸ *VA Cost Estimating Guide*, ver. 2.2, August 17, 2016.

program to Congress on a quarterly basis, among other program updates.¹⁹ Hereafter, these quarterly reports are referred to as “congressionally mandated reports.”

The act broadly defines the EHRM program as “any activities... to procure or implement an electronic health or medical record system to replace” the existing electronic health record system and “any contracts or agreements entered into by [VA] to carry out, support, or analyze” these activities. The act also stipulates that reported annual and life-cycle cost estimates include, at a minimum, specific cost elements such as hardware and testing activities, which are similar to categories defined by OEHRM as IT infrastructure.

Office of Electronic Health Records Modernization

Created in June 2018 by the VA Secretary, OEHRM is responsible for ensuring VA successfully prepares for, deploys, and maintains the new electronic health record system and supporting health IT tools. OEHRM’s executive director reports directly to the VA deputy secretary. This office also works in collaboration with OIT to ensure the completion of IT infrastructure upgrades that must be completed to deploy and sustain the new electronic health record system.

Cost-Estimate Development and Reporting

OEHRM is responsible for developing the program’s LCCE to include the costs of IT infrastructure-related upgrades. OEHRM finalized the program’s initial LCCE in December 2018 and updated it in August 2020.²⁰ Both LCCE iterations included approximately \$4.3 billion for IT infrastructure upgrades.

Importantly, OEHRM has also been designated as the responsible entity for reporting the program’s LCCE to Congress. OEHRM prepares congressionally mandated reports quarterly to meet requirements set forth in the Veterans Benefits and Transition Act of 2018. Among the report sections is the program’s LCCE. OEHRM’s chief financial officer and program control director compile, edit, and approve the sections of the congressionally mandated reports. Once approved, the sections are assembled into a cohesive report for OEHRM’s and VA’s concurrence. In addition to these reports, OEHRM provides briefings to congressional committee staff on the program, which could include discussion of the program’s LCCE but are not substitutes for the congressionally mandated reports.

¹⁹ Veterans Benefits and Transition Act of 2018, Pub. L. No. 115-407 § 503 (2018): “Not later than 30 days after the end of each fiscal quarter . . . , the Secretary shall submit to the appropriate congressional committees the most recent updated versions, if any exist, of” among other documents, the annual and life-cycle cost estimates.

²⁰ Some information provided to support the December 2018 cost estimate was developed by VA prior to the June 2018 establishment of OEHRM.

IT Infrastructure Upgrades Needed to Support the New System

Significant upgrades to VA’s IT infrastructure are needed to ensure the successful deployment of the new electronic health record system. According to OEHRM documents, these upgrades are considered both complex and critical and must be completed before system deployment. For example, outdated end-user devices, such as desktop and laptop computers, must be replaced with devices compatible with the new system so that clinicians can access patient health records. Table 1 lists the 12 categories of IT infrastructure included in the August 2020 LCCE.

Table 1. August 2020 10-Year IT Infrastructure Cost Estimate by Category

Category	Amount (in millions)
1. End-user devices	718
2. Legacy system modifications and interfaces	528
3. Joint security architecture (wide area network)	421
4. VA local area network	370
5. Wi-Fi	362
6. Testing activities	362
7. Medical devices	357
8. Identity and access management	296
9. Security	211
10. Data migration and syndication	155
11. Interoperability	140
12. Phones	58
Fees and Other Costs	370
Total*	4,346

Source: OEHRM 10-Year Infrastructure Cost, updated August 2020. The audit team ordered the presentation of categories by descending cost amounts.

**Total may not sum due to rounding.*

OEHRM is responsible for obtaining funding for most of the IT infrastructure categories presented in table 1. Some IT infrastructure upgrades necessary to support the system are also partially funded by OIT or VHA. For example, OIT and VHA are expected to fund upgrades including some end-user devices and medical devices. OIT is primarily responsible for providing staffing resources to complete many of the upgrades, including those related to the wide area network and installation and deployment of end-user devices.²¹

²¹ For more on the roles and responsibilities of VA offices, life-cycle cost estimate methodology, and the system implementation schedule, see appendix A.

Results and Recommendations

Finding 1: OEHRM’s IT Infrastructure Upgrade Cost Estimates Were Unreliable but Process Improvements Were Made

The OIG found that OEHRM’s cost estimates for the IT infrastructure upgrades necessary to support the new electronic health record system did not fully meet the characteristics of a reliable cost estimate, according to VA standards. VA and GAO guidance states that cost estimates should be well-documented, comprehensive, credible, and accurate.²² Furthermore, VA financial policy defines these characteristics as “standards” for assessing cost estimates.²³ The team evaluated OEHRM’s two cost estimates for IT infrastructure upgrades, one dated December 2018 for about \$4.3 billion and the other August 2020 for about the same amount, and found they did not fully meet the characteristics for being well-documented, comprehensive, and credible. The team was unable to thoroughly evaluate both estimates for accuracy because they lacked sufficient documentation.

These issues were generally caused by a lack of effective quality control procedures to evaluate the cost estimates. In particular, VA did not complete an independent cost estimate, which likely would have revealed many of the issues found during this audit and allowed OEHRM to improve the reliability of its estimates earlier. OEHRM leaders also stated their initial and primary focus was on the Cerner contract and deployment of the new electronic health record system. They prioritized those activities over efforts such as the development of cost estimates. OEHRM also lacked procedures to help ensure staff consistently developed reliable estimates in accordance with VA and GAO guidance.

Due in part to discussions with the audit team, OEHRM has already taken actions to improve the reliability of its estimates. The OIG acknowledges those efforts and encourages the office to continue strengthening its cost-estimating procedures to ensure all characteristics of a reliable estimate are consistently and fully met. VA leaders need reliable cost estimates to successfully plan, prepare, and execute necessary upgrades that will align with and support the new system deployment schedule.

What the OIG Did

The audit team evaluated OEHRM’s two IT infrastructure cost estimates. A December 2018 cost estimate was the first submitted to Congress in a May 2019 congressionally mandated report. In

²² VA, *Cost Estimating Guide*, version 2.2; GAO’s *Cost Estimating and Assessment Guide*, GAO-09-3SP, March 2009 and GAO-20-195G, March 2020. The guides outline the four characteristics of a reliable cost estimate.

²³ VA Financial Policy, “Life Cycle Cost Estimating,” defines these characteristics as the “standards” by which cost estimates are assessed.

August 2020, an updated estimate was provided through a congressional briefing. The team evaluated these estimates and supporting documentation in accordance with VA standards, as well as VA and GAO guidance. The team gathered evidence from VA staff, including OEHRM and OIT personnel. Additionally, the team conducted interviews with staff from OEHRM, OIT, and VA’s Office of Management. For more on the audit’s scope and methodology, see appendix B.

OEHRM’s IT Infrastructure Cost Estimates Did Not Fully Meet the Characteristics of a Reliable Estimate

To provide context for the audit team’s analysis, this section examines more closely the VA and GAO cost-estimating guidance on the four characteristics of a reliable cost estimate.²⁴ The audit team refers to these characteristics as VA standards, per financial policy, for reliable cost estimates in the discussions that follow.²⁵ VA’s cost-estimating guide and financial policy were created in response to a GAO report that found, in part, that VA lacked cost-estimating policies that incorporated best practices and that VA’s cost estimates evaluated by GAO did not meet or only partially met each of the four characteristics.²⁶ Table 2 provides more detail on the characteristics of a reliable cost estimate as defined by VA and GAO.

Table 2. Four Characteristics of a Reliable Cost Estimate

Characteristic	Description
Well-documented	<ul style="list-style-type: none"> • Includes supporting documentation that explains the process, sources, and methods used to create the estimate • Contains the underlying data used to develop the estimate • Documents steps performed so that someone unfamiliar with the program can recreate it efficiently with the same result • Is adequately reviewed and approved by senior leaders
Comprehensive	<ul style="list-style-type: none"> • Accounts for all possible costs • Documents all cost-influencing ground rules and assumptions
Credible	<ul style="list-style-type: none"> • Includes a sensitivity analysis that identifies a range of possible costs based on varying major assumptions and data inputs

²⁴ VA, *Cost Estimating Guide*, version 2.2; GAO, *Cost Estimating and Assessment Guide*.

²⁵ VA Financial Policy, “Life Cycle Cost Estimating.”

²⁶ GAO, *Agencies Need to Address Significant Weaknesses in Policies and Practices*, GAO-12-629, July 2012.

Characteristic	Description
Credible (<i>continued</i>)	<ul style="list-style-type: none"> • Includes a risk and uncertainty analysis that quantifies the risks and identifies the effects of changing assumptions and factors • Is compared to an independent cost estimate
Accurate	<ul style="list-style-type: none"> • Has few, if any, minor mathematical errors • Is not overly conservative or optimistic, and is based on an assessment of costs likely to be incurred • Is regularly updated to reflect the current status of the program

Source: VA Cost Estimating Guide, version 2.2, August 17, 2016, and GAO, Cost Estimating and Assessment Guide, GAO-09-3SP, March 2009 and GAO-20-195G, March 2020.

The audit team’s review and analysis of each estimate by characteristic is presented in the following sections. Each section also contains a description explaining the importance of the respective characteristic based on VA standards.

Cost Estimates Were Not Well-Documented

Sufficient documentation supports the validity of an estimate and provides an audit trail to original source documents. That audit trail allows an estimate to be easily recreated and updated. For example, a well-documented estimate identifies the methodology used in enough detail to allow an independent party to trace the price per unit of an item to the documentation used to calculate the expected cost, such as a vendor quote. It also provides evidence that the cost estimate was reviewed and approved by management. Neither cost estimate reviewed by the team fully met the characteristic of being well-documented, as described below.

The December 2018 estimate lacked documentation of the methodology, key assumptions, and calculations used to develop the estimate. For example, the methodology for developing all the estimate’s nine cost categories states that “costs were estimated by subject matter experts and will be adjusted in future years based on the changing needs of the program.” OEHRM was unable to provide documentation supporting these experts’ methodologies, assumptions, and calculations. This description did not provide sufficient detail for the audit team to verify cost estimates were appropriately calculated or to evaluate the methodology for how these experts determined the total cost per category.

The team noted significant improvement for the August 2020 cost estimate as its cost categories were supported by more details and documentation than the December 2018 estimate. For example, the August 2020 end-user device cost category details 20 subcategories including laptops and desktops, monitors, and printers. In contrast, the December 2018 estimate only provided end-user device totals by year. Despite including additional information, the

August 2020 cost estimate was still not considered well-documented because it lacked information to support most cost categories. For example, OEHRM did not have underlying data to support how dollar figures manually entered in the estimate for laptop and desktop computer costs were derived or details identifying how source data were used to develop other figures.

For the August 2020 cost estimate, OEHRM was also unable to provide documentation to support subject matter experts' methodologies, assumptions, and calculations. Furthermore, much of the documentation provided by OEHRM to support calculations in this estimate was in the form of independent government cost estimates.²⁷ Still, the audit team was unable to determine how many of those independent government cost estimates were used in developing the IT infrastructure upgrade cost estimates. For example, despite the end-user device cost category having more supporting details than most other categories, the team was unable to trace independent government cost estimates to their respective costs in the August 2020 estimate for about 43 percent of the unique end-user device items. The cost category estimate also contained manually entered dollar figures and adjustments to the estimate that the team was unable to trace back to underlying data. According to VA cost-estimating guidance, a well-documented estimate is one that documents steps well enough to enable a reviewer unfamiliar with the program to efficiently recreate it. Because the August 2020 cost estimate was not documented well enough to trace amounts back to source documentation and the audit team could not efficiently recreate the estimate, the team determined that the August 2020 cost estimate was not well-documented according to VA cost-estimating guidance, despite the improvements made since the December 2018 cost estimate.

The OIG found VA senior leaders reviewed and approved both estimates. Both estimates were routed through an internal VA electronic system that requires senior leader review and approval before release to Congress.

Cost Estimates Were Not Comprehensive

Comprehensive cost estimates are necessary to provide management officials with reasonable assurance that all possible costs are included so they can make the most well-informed budgetary and investment decisions. Both cost estimates were not comprehensive. The OIG found that OEHRM did not include all program-related IT infrastructure upgrade costs in either of the cost estimates because it did not include upgrades anticipated to be funded by OIT or VHA. As of August 2020, OEHRM expected OIT to fund about \$1.2 billion for IT infrastructure upgrades and VHA to fund about \$1.3 billion. VA cost-estimating guidance states that estimates include

²⁷ According to the Federal Acquisition Regulation, an independent government cost estimate is a tool used by contracting officers to evaluate the reasonableness of offered prices. Prepared prior to awarding a contract, these estimates ensure the price paid is fair and reasonable and serve a different purpose than the LCCE and independent cost estimate discussed later in this report.

all costs regardless of funding source, therefore these costs should have been included. These omissions are discussed in more detail in finding 2.

Further, the audit team was unable to confirm that all cost elements were included in every cost category and that OEHRM properly documented all cost-influencing ground rules and assumptions, because—as noted above—OEHRM did not provide sufficient underlying data and documentation to support estimated amounts.

Cost Estimates Were Not Credible

Credible cost estimates incorporate the results from a sensitivity analysis and from a risk and uncertainty analysis. The estimates are also measured against independent or third-party cost estimates.²⁸ A sensitivity analysis is used to explain the degree of impact each cost factor has on the overall estimate and provides leaders with cost ranges for each category and an explanation of why the cost estimates could change. A risk and uncertainty analysis adds to the credibility of the estimate because it identifies the level of confidence in the estimate, or the likelihood that actual costs may differ from estimated costs.²⁹

OEHRM partially met this characteristic as it conducted a sensitivity analysis and a risk and uncertainty analysis for the December 2018 cost estimate. These analyses considered factors and risks specific to the IT infrastructure upgrades cost estimates. OEHRM, however, did not update its risk and uncertainty analysis for the August 2020 cost estimate. GAO cost-estimating guidance states that an update to this analysis should be performed periodically to reflect changes to risks. The audit team noted that these analyses did not include any mention of expected contributions from OIT and VHA to fund some infrastructure upgrades and the risk to the accuracy of the estimate should these entities be unable to sufficiently fund these upgrades.

Neither cost estimate was compared to an independent or third-party cost estimate as required by VA financial policy.³⁰ GAO cost-estimating guidance states that this comparison is one of the best ways to validate the reliability and reasonableness of a cost estimate. Per GAO guidance, third-party cost estimates typically incorporate adequate risk and tend to be more conservative by estimating higher costs than a program office would estimate. This issue is discussed in further detail later in this finding.

²⁸ GAO, *Cost Estimating and Assessment Guide*: A third-party cost estimate is conducted by an independent entity using the same detailed technical information as the program estimate and serves as a comparison with the program estimate to determine whether it is accurate and realistic.

²⁹ GAO, *Cost Estimating and Assessment Guide*. GAO defines risk as a potential event that could affect the program positively or negatively. GAO defines uncertainty as “a situation in which little to no information is known about the outcome.”

³⁰ VA Financial Policy, “Life Cycle Cost Estimating.”

Accuracy of Cost Estimates

An accurate cost estimate ensures information presented to program management personnel is reasonably correct, not overly conservative or optimistic, regularly updated, and has few, if any, mathematical errors. The OIG attempted to review both estimates for accuracy and found that OEHRM did present a cost estimate update to Congress in August 2020. However, as of January 2021 this update had yet to be reflected in OEHRM's congressionally mandated reports. This is discussed in more detail in finding 2.

Moreover, as previously stated, neither estimate was well-documented, as OEHRM was generally unable to provide sufficient underlying data to support its calculations. Of the limited documentation provided by OEHRM for the team to review, no material mathematical errors were identified for either estimate, but there was insufficient information for the team to conclusively determine whether the estimates met this characteristic.

OEHRM's Evaluation Confirmed Some of These Weaknesses

OEHRM identified weaknesses similar to some of those identified by the audit team during an evaluation of cost categories in the August 2020 estimate. Specifically, nine of the 12 IT infrastructure categories were assigned a low maturity level by OEHRM.³¹ These nine categories, which included medical devices, security, and testing, among others, totaled \$3 billion, or about 69 percent of the total \$4.3 billion cost estimate for IT infrastructure upgrades. According to OEHRM, cost categories were assigned a low maturity level if the estimate was not well-documented, was not yet comprehensive, and had undergone little to no review by subject matter experts to determine its accuracy.

The three remaining cost categories were assigned a maturity level of medium, signifying that OEHRM considers the estimate comprehensive but not yet well-documented. This assessment confirms the OIG's conclusion that the estimates were not reliable and controls for cost-estimating procedures should be strengthened.

Lack of Effective Quality Control Procedures to Evaluate Estimates

Similar to an issue identified in the OIG's report on physical infrastructure upgrade cost estimates, deficient quality controls contributed to the unreliability of both IT infrastructure upgrade cost estimates.³² VA's Office of Programming, Analysis and Evaluation (PAE) within the Office of Management is responsible for performing independent cost estimates for all major programs and VA Secretary priorities. An independent cost estimate is a complete and fully

³¹ The maturity level defines OEHRM's assessment of each cost category estimate by assigning a rating of low, medium, or high.

³² VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*.

documented estimate developed independent of the program office. This control is used to test the reasonableness of the program office's cost estimate.³³ However, PAE did not complete an independent cost estimate for the two EHRM program-related IT infrastructure cost estimates or for the overall program LCCE that included these estimates. If one had been completed, it likely would have revealed many of the issues found during the OIG's audit and allowed OEHRM to take earlier action to improve the reliability of its estimates.

The assistant secretary for management stated PAE was not involved with these cost estimates because the office was essentially being disbanded for organizational reasons at the time the cost estimates for the EHRM program were initially created.³⁴ PAE leaders confirmed the office existed on "paper only." Some remaining PAE staff were offered to OEHRM to assist in developing the LCCE, but according to the assistant secretary for management, OEHRM did not accept the offer. As of June 2020, nearly all positions within PAE were vacant. The assistant secretary for management stated that, as of November 2020, the Office of Management, under which PAE is aligned, had yet to redefine PAE's structure, hire staff, and determine how this office will meet its independent cost-estimating responsibilities for programs in the future.

Cost-Estimate Development Was a Lower Priority

OEHRM leaders stated their primary focus was on the Cerner contract and deploying the new electronic health record system to the initial sites. Staff prioritized these competing demands over developing and documenting the cost estimates. In formulating the December 2018 cost estimate, OEHRM leaders relied significantly on cost information provided by DoD and an estimating model developed by the program's former chief business officer. However, DoD did not provide the background and source data needed to show VA how it built its estimate, and according to an OEHRM leader, VA is operationally different from DoD. Additionally, OEHRM retained only limited documentation to support the estimating model developed by the program's former chief business officer. When the team inquired about the lack of documentation, OEHRM leaders stated that it was always their intention to refine the cost estimate once they deployed the system at the initial sites.

Lack of Procedures Was a Contributing Factor

A cost-estimating team member acknowledged that OEHRM had to rely on OIT subject matter experts for many cost categories, and that those estimates had few supporting details. An OEHRM leader attributed this to the unique environment of the program, with many entities collaborating to develop the estimate. The audit team determined that lack of procedures on how to develop and support these cost estimate amounts also contributed to the lack of

³³ VA Financial Policy, "Life Cycle Cost Estimating."

³⁴ The assistant secretary for management serves as the chief financial officer for the department.

documentation. When the audit team inquired about the existence of procedures, OEHRM leaders and cost-estimating team members stated they were making improvements to processes and developing procedures. As of January 2021, OEHRM began developing cost-estimating procedures for staff to follow when developing estimates.

Additionally, in the time between when the two estimates were developed, the number of staff assigned to the cost-estimating process grew significantly, including the addition of several contractor support staff to the team. None of the nearly 40 staff involved in preparing the August 2020 cost estimate had also been involved in developing the December 2018 estimate. Significant changes in staffing can increase the likelihood staff do not apply cost-estimating guidance consistently, making it more important to have procedures for complex program operations. Those procedures should help ensure consistent adherence to agency standards and guidance. OEHRM leaders confirmed cost-estimating staff should follow VA and GAO cost-estimating guidance, but this guidance is not specific enough to cover the complexities of every program.

OEHRM's Actions to Improve Cost Estimates

The audit team's evaluation of the August 2020 cost estimate determined the estimate was supported by significantly more details than the initial estimate and confirmed OEHRM had begun improving its cost estimates. In January 2021, an OEHRM leader and a cost-estimating team member acknowledged the need for further improvements. OEHRM began developing draft procedures for staff to follow and attributed this work partially to discussions with the audit team. These discussions made them aware of areas for improvement. OEHRM showed the team a draft of these new procedures, and they appear to align with cost-estimating guidance and may include some controls to address the issues identified in this report.

Additionally, an OEHRM cost-estimating team member also stated OEHRM has taken steps to improve its documentation, which will allow for cost estimates to be efficiently recreated by independent reviewers. Those measures include cost model improvements such as identifying in clearer detail the assumptions relied on, sources of information, and other narrative text to assist an independent reviewer in understanding the basis of the estimate. These cost model improvements were also provided to the audit team. The OIG believes that, along with procedures to evaluate and maintain documentation, these steps will improve the reliability of future cost estimates.

Finding 1 Conclusion

There is considerable risk that a program could experience cost overruns when initial estimates are unrealistic. Without reliable estimates, the program may also not receive sufficient funding to meet its targets under the system deployment schedule, which could result in costly delays. VA uses cost estimates to plan programs, develop budget requests, make acquisitions, and monitor

execution. Reliable cost estimates also allow both VA and Congress to make wiser key budgetary and future investment decisions. The relevant stakeholders should have reliable information on the program's funding needs and the expected cost of those programs.

In 2012, GAO issued a report finding that the VA cost estimates it evaluated did not meet or only partially met each of the four characteristics of a reliable cost estimate.³⁵ In 2021, the VA OIG issued a report identifying that cost estimates for physical infrastructure upgrades needed to support the new electronic health record system were also not reliable. This report on IT infrastructure costs helps complete the picture of VA's cost-estimating procedures for a significant portion of the EHRM program's approximately \$16.1 billion total cost. Many of the concerns the OIG identified in its prior physical infrastructure cost-estimating report also apply to VA's IT infrastructure upgrades. The OIG notes, however, that OEHRM appears to be moving in the right direction to refine cost-estimating procedures and provides recommendations for how the program office can take further actions to ensure costs estimates are reliable.

Given the significant investment in the EHRM program, it is critical that VA has reliable estimates that will help ensure it requests sufficient funding to complete the necessary IT infrastructure upgrades. VA leaders need this information to successfully plan, prepare, and execute the IT infrastructure upgrades to support OEHRM's system deployment schedule.

Recommendations 1–3

The OIG made the following recommendations to the executive director of the Office of Electronic Health Record Modernization:

1. Ensure an independent cost estimate is performed for program life-cycle cost estimates related to information technology infrastructure costs.
2. Reassess the cost estimate for Electronic Health Record Modernization program-related information technology infrastructure and refine as needed to comply with VA's cost-estimating standards.
3. Develop procedures for cost-estimating staff that align with VA cost-estimating guidance.

The OIG also made a recommendation in a previous report for VA's assistant secretary for management and chief financial officer to ensure PAE, or another office performing its duties, performs an independent cost estimate of EHRM program life-cycle cost estimates.³⁶ Once

³⁵ GAO, *Agencies Need to Address Significant Weakness in Policies and Practices*.

³⁶ VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*.

corrective actions are implemented, the department will, in part, address concerns identified in this finding that independent cost estimates were not performed for program estimates.

Management Comments

The OEHRM executive director concurred with the recommendations and provided action plans for each.

For recommendation 1, OEHRM responded that it is coordinating with the Office of Management to complete an independent cost estimate for life-cycle cost estimates that will include IT infrastructure costs funded by OIT and VHA. For recommendation 2, OEHRM responded that it will ensure compliance with VA financial policy and VA and GAO cost-estimating guidance. Upon completion of the independent cost estimate, OEHRM will reassess and refine its own cost estimate for the EHRM program. In the interim, as infrastructure is upgraded, the cost-estimating team will continue to gather data to further refine its cost estimate. For recommendation 3, OEHRM responded that it will continue to refine its internal cost-estimating procedures in compliance with VA financial policy and VA and GAO cost-estimating guidance. OEHRM's life-cycle cost estimate management plan will be published to document changes.

OEHRM stated its action plans are part of the strategic review, and as a result, target completion dates for implementing these plans were not provided. Target completion dates will be provided as soon as information becomes available.

OEHRM also provided technical comments on the report stating it will continue to further refine its cost-estimating procedures, and it is willing to engage with the OIG to facilitate better mutual understanding of the EHRM program life-cycle cost estimate. Appendix C contains the full text of VA's response.

OIG Response

Responsive action plans were provided for each of the three recommendations; however, target completion dates for implementing those plans were not provided due to the program's ongoing strategic review. This review, which began in March 2021, will consist of a full assessment of the EHRM program and is planned to take no more than 12 weeks. The OIG acknowledges the impact the ongoing strategic review could have on implementing corrective actions and will continue to monitor the progress made to address the findings and recommendations in this report. The recommendations will be considered open until VA has provided sufficient evidence to demonstrate the cited corrective actions have been implemented.

Finding 2: OEHRM Did Not Include All IT Infrastructure Upgrade Cost Estimates or Accurately Present Yearly Estimates in Congressionally Mandated Reports

OEHRM did not report all program-related IT infrastructure costs in the EHRM program's LCCE nor did the office accurately present known updates to expected costs. The OIG found OEHRM did not include critical program-related IT infrastructure upgrades in the program's LCCE reported to Congress, effectively underreporting the cost of the program by nearly \$2.5 billion. As discussed in the sections that follow, according to OEHRM officials, these costs are for IT infrastructure upgrades OEHRM expects OIT and VHA to fund. Consequently, they believed those costs were outside their office's scope of responsibility for reporting. OEHRM also lacked formal agreements with OIT and VHA to define expectations on each entity's cost contributions over the 10-year deployment period, which increases the risk of insufficient funding to complete the upgrades if OIT and VHA cannot fund the upgrades as anticipated. Because these upgrades are cited by OEHRM as "critical" to the program and because an LCCE should encompass all costs, regardless of funding source, these costs should have been disclosed as part of the program LCCE.³⁷

The OIG also found OEHRM did not accurately present IT infrastructure yearly cost estimates in four quarterly reports submitted to Congress. In February 2020, OEHRM submitted its fiscal year (FY) 2021 budget request to reflect plans to complete IT infrastructure upgrades earlier than initially anticipated, which resulted in an increase in expected costs for that year. This change necessitated updates to expected annual costs for future years, but OEHRM did not update these yearly costs in any of the four congressionally mandated reports submitted from April 2020 through January 2021. This occurred because OEHRM lacked procedures to assist staff in identifying if an LCCE update must be included in the congressionally mandated reports, and, if so, when this update must be completed. With costs for critical IT infrastructure upgrades either omitted from or inaccurately presented in the program's LCCE, Congress does not have a comprehensive picture of total program costs needed to make informed oversight and investment decisions.

What the OIG Did

The audit team evaluated eight congressionally mandated reports submitted by VA and congressional hearing transcripts from May 17, 2018, the date of the EHRM contract award to Cerner, through January 31, 2021. The team reviewed applicable laws, policies, and guidance and gathered evidence from VA officials, including records and internal documents held by OEHRM and OIT. The team also conducted interviews with staff from OEHRM, OIT, VHA, and

³⁷ *VA Cost Estimating Guide*, ver. 2.2.

VA's Office of Congressional and Legislative Affairs. For more on the audit's scope and methodology, see appendix B.

OEHRM Did Not Include Nearly \$2.5 Billion in Costs for IT Infrastructure Upgrades Needed to Support the Program in Reports to Congress

Since 2018, VA has routinely reported to Congress that the total program would cost approximately \$16.1 billion.³⁸ This amount includes about \$4.3 billion for expected IT infrastructure upgrades. However, the \$4.3 billion figure omits nearly \$2.5 billion for IT infrastructure upgrades needed to support the new electronic health record system. The \$2.5 billion of unreported costs includes about \$1.2 billion and \$1.3 billion for IT infrastructure upgrades OEHRM expects OIT and VHA, respectively, to fund. The audit team confirmed with VA officials from both OIT and VHA that these costs, expected to be incurred over the 10-year deployment schedule, were not reported to Congress by these offices.

Unreported Costs Pertain to Critical IT Infrastructure Needs

The majority of this \$2.5 billion is to cover upgrade costs for ongoing technology refreshment of end-user devices that typically fall under the responsibility of OIT and medical device upgrades that fall under the responsibility of VHA.³⁹ These upgrades are critical to successful deployment of the new system because clinicians need them to connect to the new system. For example, VA policy establishes that desktop and laptop computers will be replaced every four years.⁴⁰ This is considered routine technology refreshment. As these devices are replaced through the refreshment cycle, OIT plans to replace them with EHRM-compatible devices.

Similarly, upgrading medical devices, such as patient monitors, is critical for clinicians to capture data in the new system and is relied on for providing patient care. OEHRM paid for medical device upgrades at initial sites but expects VHA to fund these upgrades at other VA facilities in later years. As the system is implemented at future sites, OEHRM expects costs for these infrastructure upgrades to be reduced because OIT or VHA will have already paid to upgrade to devices compatible with the new electronic health record system.

³⁸ *Hearing on 180-Day Review of the Electronic Health Record Modernization Program Before the Subcommittee on Technology Modernization, US House Committee on Veterans' Affairs*, 115th Cong. (November 14, 2018).

³⁹ OIT is also expected to fund some upgrades for the local area network, phones, and Wi-Fi.

⁴⁰ VA Directive 6401, *VA Standard Desktop Configurations*, June 24, 2002.

The LCCE Should Include All Costs Regardless of Expected Funding Source

As these IT infrastructure upgrades are critical to support deployment and sustainment of the new electronic health record system, they are a necessary program cost. VA and GAO cost-estimating guidance explains that an LCCE should include all costs for every aspect of the program, regardless of funding source.⁴¹ Therefore, even though OIT and VHA may bear the costs, VA guidance requires that these costs be included in the LCCE because they are for upgrades critical to supporting system deployment.

Further, to meet the system deployment schedule, OEHRM may have to bear some of these infrastructure costs if OIT and VHA are unable to fund them. An OEHRM leader stated there is risk of this occurring at some point over the 10-year system deployment life cycle. Indeed, at the initial deployment sites, OEHRM did have to fund many of the needed IT infrastructure upgrades.

Consistent with the OEHRM leader's statement, the audit team identified that OIT's infrastructure readiness program, which includes technology refreshment, has historically been underfunded. Thus, there is some risk that OIT may not fund technology upgrades sufficiently to cover its expected IT infrastructure contributions.⁴²

OEHRM Did Not Believe IT Infrastructure Costs Funded by Other VA Entities Needed to Be Included in Program Life-Cycle Cost Estimates

When the audit team asked OEHRM officials why the \$2.5 billion in IT infrastructure costs were omitted from the program LCCE and were not disclosed in the congressionally mandated reports, they responded that those upgrade costs were not within OEHRM's scope of funding responsibility, so they did not need to report those costs. OEHRM's position is similar to, and also discussed in, the OIG's report on physical infrastructure upgrade cost estimates.⁴³ This section discusses the law, guidance on cost-estimating, and a congressional inquiry that are inconsistent with OEHRM's stance that it is not responsible for reporting to Congress OIT and VHA-funded IT infrastructure upgrade costs needed to implement the new electronic health record system.

⁴¹ *VA Cost Estimating Guide*, ver. 2.2; GAO, *Cost Estimating and Assessment Guide*.

⁴² OIT's infrastructure readiness program guides the ongoing refresh of IT infrastructure that sustains all VA IT operations.

⁴³ VA OIG, *Deficiencies in Reporting Reliable Physical Infrastructure Cost Estimates for the Electronic Health Record Modernization Program*.

The Veterans Benefits and Transition Act of 2018 requires the department to report EHRM program life-cycle cost estimates. The act’s definition of the EHRM program includes “any activities... to procure or implement an electronic health or medical record system” and “any contracts or agreements entered into by [VA] to carry out, support, or analyze the activities...”⁴⁴ OEHRM has itself defined IT infrastructure upgrades as necessary to deploy and sustain the new system, and categorized some of the upgrades to be funded by OIT and VHA as critical to support the new system.⁴⁵

Moreover, as previously indicated, VA’s own cost-estimating guidance states that an LCCE “encompasses all past (or sunk), present, and future costs for every aspect of a program, *regardless of funding source*” (emphasis added).⁴⁶ Therefore, the audit team concluded those IT infrastructure upgrades were activities related to implementing the electronic health record system and the costs should be included in the program’s LCCE that OEHRM reported to Congress.

A December 2018 letter to VA from members of the House Committee on Veterans’ Affairs also suggests that committee members wanted to know about all program-related costs. The letter requested OEHRM’s executive director provide a detailed breakdown of any actual or anticipated expenditures from any accounts other than the EHRM account.⁴⁷ The letter expressed the committee’s concern about “cost uncertainty in the program” and stated that a detailed breakout of all program-related costs, regardless of funding source, was necessary to provide meaningful oversight of the program. The committee explicitly requested information on OIT funding commitments expected for technology refreshment. This inquiry further supports that members of Congress intended for all costs to be transparently reported to them. However, OEHRM had not included the estimated \$2.5 billion of IT infrastructure upgrade costs in any of its congressionally mandated reports as of January 2021. The OIG believes disclosure of these costs would provide Congress valuable information it seeks for overseeing the EHRM program.

Lack of Formal Agreements

The audit team identified increased risk of insufficient funding to complete upgrades for activities that should have been included in the program LCCE. The estimated figures only reported costs OEHRM expects to bear, assuming that OIT and VHA will be able to contribute billions of additional funding for necessary upgrades. However, OEHRM lacks formal

⁴⁴ Veterans Benefits and Transition Act of 2018, Pub. L. No. 115-407 § 503 (2018).

⁴⁵ The OEHRM 10-Year Infrastructure Cost document comments on “OIT’s and VHA’s financial contributions to items critical to the EHRM program (e.g., end user devices, medical devices, etc.)” August 2020.

⁴⁶ *VA Cost Estimating Guide*, ver. 2.2.

⁴⁷ US House Committee on Veterans’ Affairs, Subcommittee on Technology Modernization, letter to the OEHRM executive director and VA’s assistant secretary for management and chief financial officer, December 11, 2018.

agreements with OIT and VHA that commit those agencies to funding these upgrades in line with OEHRM's expectations.

If OIT and VHA leaders are unaware of the total amount of contributions expected from their organizations over the 10-year deployment, these entities may not be positioned to sufficiently fund the needed IT infrastructure upgrades. OEHRM would then have to assume these costs in addition to the total \$4.3 billion it expects to bear to successfully deploy the new system on schedule.

Interviews with OIT and VHA leaders confirmed there was a general understanding these offices would share some of the IT infrastructure upgrade costs over the 10-year system deployment; however, these leaders were unaware of the specific dollar figure contribution expected over this time frame. The audit team found a formal agreement between OIT and OEHRM, but that agreement only outlined contribution expectations for FY 2020.

Without formal agreements, OIT and VHA may also be unaware if changes to their total expected dollar contributions occur. The audit team has seen evidence in OEHRM's internal working documents that the office's expectation for OIT and VHA contributions may change. In an August 2020 document, OEHRM cited expected OIT and VHA's contributions of nearly \$2.5 billion, and by November 2020 that total had increased to about \$2.6 billion.

OEHRM's internal documents confirm that its assumptions about OIT and VHA's contributions are significant and carry a substantial risk to the accuracy of the overall IT infrastructure cost estimate. Developing formal agreements would help ensure the funding entity is appropriately identified and provide reasonable assurance that all entities are aware of their financial expectations to mitigate the risk of insufficient funding.

OEHRM Did Not Accurately Update the LCCE Submitted to Congress

In February 2020, VA submitted its FY 2021 budget request, which included a request of about \$1.2 billion for EHRM program-related IT infrastructure upgrades, an increase of approximately 115 percent from OEHRM's estimate for that year presented in the program's December 2018 LCCE.⁴⁸ OEHRM leaders attributed this increase to incurring more costs earlier in the 10-year deployment schedule and stated that, despite the increase, total cost estimates for IT infrastructure upgrades over the 10-year deployment schedule would remain at the initially projected \$4.3 billion.

To account for the significant increase in FY 2021 anticipated costs while maintaining the same overall total estimated cost, OEHRM should have decreased future years' amounts in its presentation of annual cost estimates. Yet, as of January 2021, four congressionally mandated reports had been submitted to Congress since the budget request, and OEHRM had yet to reflect

⁴⁸ OEHRM initially estimated about \$549 million for IT infrastructure upgrades in FY 2021.

necessary changes to the annual cost estimates for those years. Instead, these mandated reports simply stated the program’s life-cycle cost estimate had not been updated since the last congressional submission.

By law, VA is required to provide Congress with quarterly program status updates that include updates to annual cost estimates through its mandated reports.⁴⁹ Additionally, VA financial policy states that life-cycle cost estimates should be regularly updated to reflect the current status of the program.⁵⁰

Although OEHRM had not presented an annual cost update in any of the four congressionally mandated reports as of January 2021, the office provided a briefing to congressional staff in August 2020 that included an updated LCCE reflecting annual cost estimate changes for FY 2021 through FY 2027. Still, nearly six months had elapsed from when OEHRM officials learned of these changes to the time they presented the changes to congressional staff. Table 3 shows these cost estimate changes by year from FY 2021 through the end of the system’s 10-year deployment schedule.

**Table 3. Changes in OEHRM’s IT Infrastructure Cost Estimates by Year
(Amounts in Millions)**

Estimate	2021	2022	2023	2024	2025	2026	2027
Initial LCCE	549	530	515	500	485	470	473
August 2020 LCCE	1,181	952	445	325	203	273	217
Difference	632	422	-70	-175	-282	-197	-256

Source: OEHRM congressionally mandated report on the oversight of the Electronic Health Record Modernization Program, May 2019, and Office of Electronic Health Record Modernization Update, dated August 2020. The LCCE presentation was modified to show FY 2021 through the end of the system deployment. Fiscal years 2018 through 2020 are not shown.

When the audit team asked why OEHRM updated the annual cost estimates for IT infrastructure upgrades in the August 2020 briefing, but not in subsequent congressionally mandated reports, OEHRM leaders stated that the August 2020 cost estimate update occurred at the request of lawmakers. Based on this response, it appears that OEHRM may not have provided an update to the program cost absent the specific congressional request. Even after OEHRM gave the August 2020 briefing to congressional staff, both the October 2020 and January 2021 congressionally mandated reports omitted these changes.

⁴⁹ Veterans Benefits and Transition Act of 2018, Pub. L. No. 115-407 § 503 (2018).

⁵⁰ VA Financial Policy, “Life Cycle Cost Estimating.”

OEHRM Lacked Procedures for Updating Reports to Congress

The OIG found OEHRM did not have procedures to assist staff in determining if they need to include an updated cost estimate in the congressionally mandated report. Instead, they rely on unclear internal guidance that does not provide staff with steps to ascertain if they need to update the LCCE and, if so, when that update should be completed and included in the congressionally mandated reports. An OEHRM leader formerly in charge of the cost-estimating team also told the audit team that there was no expectation to have the LCCE updated by a specific date. The OEHRM leader explained that the department's priority was on deploying the system at the initial sites.

To meet the intent of the act and provide Congress with relevant information, OEHRM should ensure that its procedures provide requirements to staff to include the most current and accurate information available in congressionally mandated reports. In February 2021, OEHRM stated its next congressionally mandated report should include the updated LCCE.

Finding 2 Conclusion

By not including the expected costs of some IT infrastructure upgrades necessary to deploy and sustain the new system in congressionally mandated reports, OEHRM has underreported the EHRM program's total cost by about \$2.5 billion, or 15 percent. This is a significant portion of one of the program's three main cost components. Reporting the entire expected program cost is critical to ensuring transparency in reporting to lawmakers. OEHRM also did not update its LCCE to accurately reflect anticipated changes in yearly costs in four congressionally mandated reports. These reports are how OEHRM is required to routinely update Congress on annual cost changes. IT infrastructure upgrades are critical to support the new electronic health record system, and the associated costs should be accurately reported to stakeholders, regardless of funding source. Without accurate reporting, VA and Congress risk not having all the information necessary to make the most informed oversight, policy, and funding decisions for the EHRM program. Transparent and accurate reporting will also inform taxpayers of how much the new system is projected to cost.

Recommendations 4–6

The OIG made the following recommendations to the executive director of the Office of Electronic Health Record Modernization:

4. Ensure costs for all information technology infrastructure upgrades funded by the Office of Information and Technology and the Veterans Health Administration or other sources needed to support the Electronic Health Record Modernization program are disclosed in program life-cycle cost estimates presented to Congress.

5. Formalize agreements with the Office of Information and Technology and the Veterans Health Administration identifying the expected contributions from each entity toward information technology infrastructure upgrades in support of the Electronic Health Record Modernization program.
6. Establish procedures that identify when life-cycle cost estimates should be updated and ensure those updated estimates are disclosed in the program's congressionally mandated reports.

Management Comments

The OEHRM executive director concurred with the recommendations and provided action plans for each. For recommendation 4, OEHRM responded that it is coordinating with OIT and VHA to ensure the costs for IT infrastructure upgrades are included in program life-cycle cost estimates presented to Congress. For recommendation 5, OEHRM responded that it will formalize agreements with OIT and VHA identifying their expected contributions toward IT upgrades in support of the EHRM program. For recommendation 6, OEHRM responded that the life-cycle cost estimate management plan established that it would update the life-cycle cost estimate in accordance with the federal budgeting process. The estimate is also updated to reflect major shifts in schedule or strategy to the 10-year deployment plan. The revised estimate is then disclosed in the program's congressionally mandated report.

OEHRM stated these action plans are part of the strategic review, and as a result, target completion dates for implementing these plans were not provided. Target completion dates will be provided as soon as information becomes available.

OEHRM also provided technical comments on the report stating it would work with the Office of Management, OIT, and VHA to incorporate IT infrastructure costs into the estimates presented to Congress. Appendix C contains the full text of VA's response.

OIG Response

The OEHRM executive director provided responsive action plans for recommendations 4 and 5. For recommendation 6, VA's action plan only partially meets the intent of the recommendation. While OEHRM responded it updates the LCCE in accordance with the federal budgeting process, their response did not address how VA will ensure updated estimates are disclosed in the program's congressionally mandated reports. The OIG reiterates the importance of OEHRM taking corrective actions to address this procedural gap. The Veterans Benefits and Transition Act of 2018 requires VA to provide Congress quarterly program status updates to annual cost estimates, and VA's own financial policy requires cost estimates to be regularly updated. To meet the intent of statutory and policy requirements and provide Congress relevant information, OEHRM should establish procedures that help staff identify when a life-cycle cost estimate

needs to be updated and ensure these updates are reflected in congressionally mandated reports. Without these procedures, staff are left to rely upon unclear internal guidance.

Target completion dates for implementing VA's action plans were not provided due to the program's ongoing strategic review. This review, which began in March 2021, will consist of a full assessment of the EHRM program and is planned to take no more than 12 weeks. The OIG acknowledges the impact the ongoing strategic review could have on implementing corrective actions and will continue to monitor the progress made to address the findings and recommendations in this report. The recommendations will be considered open until VA has provided sufficient evidence to demonstrate the cited corrective actions have been implemented.

Appendix A: Background

VA has long recognized the need to modernize its electronic health record system—the Veterans Health Information Systems and Technology Architecture. If successful, VA’s new system is meant to connect to DoD’s electronic health record system, which will create a lifetime health record for military service members and ultimately improve and inform the delivery of quality healthcare to veterans. After system deployment, healthcare providers could access more comprehensive medical histories for the more than nine million veterans enrolled in the VA healthcare program.

Responsibilities

VA’s OEHRM is responsible for ensuring VA successfully prepares for, deploys, and maintains the new electronic health record system, and works in coordination with OIT and VHA. In completing these necessary infrastructure upgrades, OIT responsibilities include collaborating with OEHRM to develop requirements and the implementation plan. This includes aligning OIT’s budget, projects, and plans to support the integrated approach to completing IT infrastructure upgrades. For IT infrastructure, VHA is primarily responsible for the procurement and installation of medical devices needed to connect to the new electronic health record system.

Development and Reporting of Life-Cycle Cost Estimates

OEHRM is responsible for developing the program’s life-cycle cost estimates. According to OEHRM, the methodology used in developing the program’s LCCE, to the extent practical, was based on VA and GAO cost-estimating guidance.⁵¹ Figure A.1 provides an overview of this methodology.

⁵¹ OEHRM Chief Financial Office document, *Life Cycle Cost Estimate*, January 9, 2019.

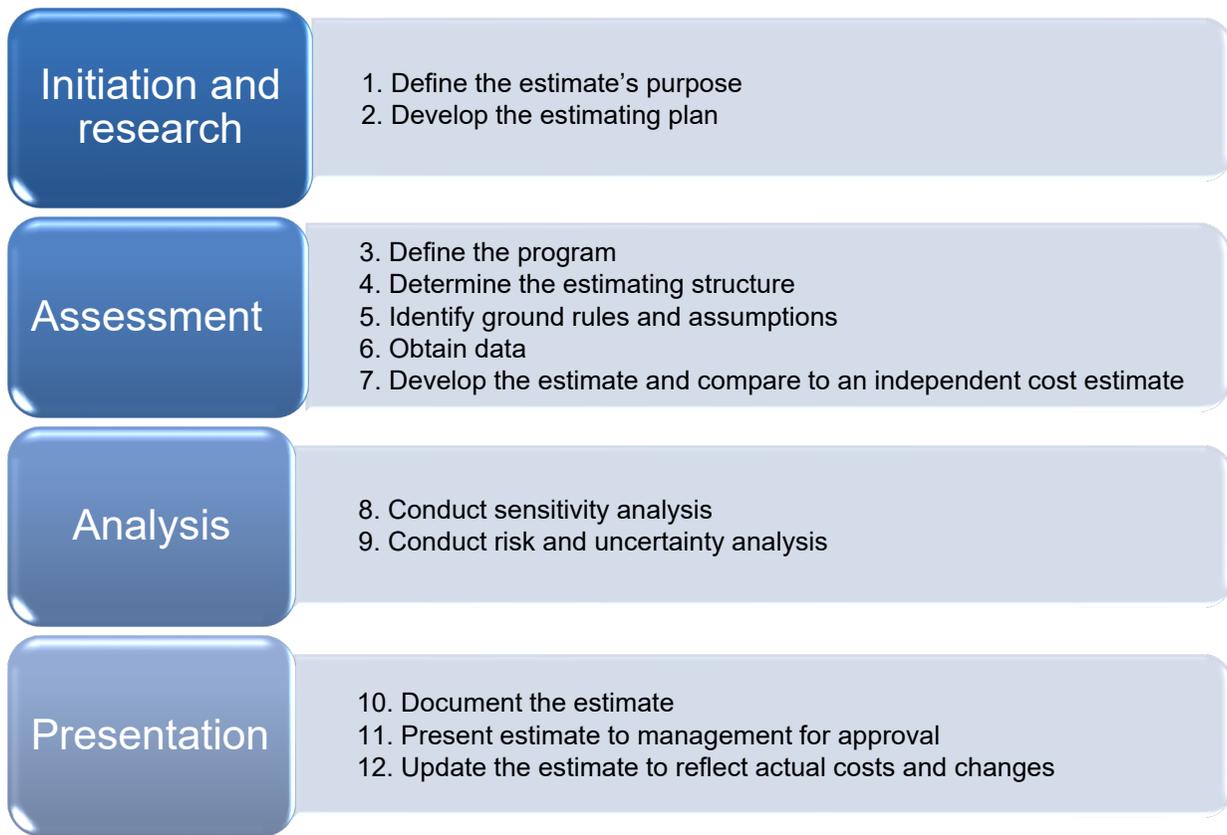


Figure A.1. Steps in the cost-estimating process.

Source: GAO, *Cost Estimating and Assessment Guide*, GAO-20-195G, March 2020.

The program's December 2018 LCCE was developed by VA staff using cost information from DoD, input from OIT experts, and an estimating model developed by the program's former chief business officer. In August 2020, OEHRM updated its program LCCE. The updated LCCE was developed by both VA and contractor support staff with subject matter experts assigned for each IT infrastructure cost category.

System Implementation Schedule

Implementation of the new electronic health record system has experienced several delays, but on October 24, 2020, the Mann-Grandstaff VA Medical Center in Spokane, Washington, became the first facility to deploy the new system. The implementation will be followed by 47 additional deployment "waves" beginning with VHA facilities in Ohio and Washington state. According to OEHRM, nationwide system deployment is expected by 2028.

Appendix B: Scope and Methodology

Scope

The audit team conducted its work from August 2020 through April 2021. The audit scope encompassed VA's cost estimates of IT infrastructure upgrades needed to support the EHRM program since the award of the EHRM contract on May 17, 2018, through August 31, 2020. The team also evaluated eight congressionally mandated reports submitted by VA and congressional hearing transcripts from May 17, 2018, through January 31, 2021. IT infrastructure is defined as all IT investments that support common systems, communications, and computing infrastructure. These investments include wide and local area networks and desktop computers, among others.⁵²

Methodology

The audit team reviewed applicable laws, requirements, standards, and VA and GAO guidance. The team also coordinated with the Office of the Counselor to the Inspector General for legal guidance. The team gathered evidence from various VA offices, including records held by OEHRM, OIT, and VA's Office of Congressional and Legislative Affairs. The team interviewed staff from OEHRM, OIT, VHA, and VA's Office of Management, including executive leaders involved with EHRM program infrastructure readiness and the development of IT infrastructure upgrade cost estimates.

Due to the COVID-19 pandemic, the team did not travel to conduct site visits. All site visits to conduct interviews and evaluate the cost estimates were conducted virtually, including through video and screen sharing capabilities. To assess VA's reporting of EHRM program LCCEs to Congress, the team reviewed numerous congressional transcripts from recent hearings at which VA officials provided oral testimony in addition to the eight mandated reports submitted to Congress mentioned above.

The team evaluated two OEHRM cost estimates for IT infrastructure upgrades, submitted as part of its program LCCE, to determine whether the estimates met VA standards and GAO cost-estimating guidance for reliability:

- An LCCE dated December 2018, submitted to Congress in May 2019 as part of its first congressionally mandated report
- An updated LCCE, submitted to Congress through a briefing in August 2020

The IT infrastructure cost estimates and provided supporting documents were assessed for their adherence with the four characteristics of a reliable cost estimate as defined by VA standards and

⁵² VA Directive 6008, *Acquisition and Management of VA Information Technology Resources*.

VA and GAO cost-estimating guidance. According to those governing authorities, a reliable cost estimate should be well-documented, comprehensive, credible, and accurate. The audit team evaluated all nine IT infrastructure cost categories comprising the December 2018 estimate, and all 12 IT infrastructure cost categories within the August 2020 cost estimate. For each cost category, the team used criteria specific to each characteristic to conduct its review. Among the work performed, the team

- reviewed any provided ground rules and assumptions,
- examined available cost models and supporting documentation to understand the methodology used and basis of estimate for each cost category,
- traced amounts in the estimate back to underlying source data when information was available, and
- assessed any mathematical formulas used for accuracy.

The team also validated that VA leaders reviewed and approved both LCCEs and assessed whether PAE conducted an independent cost estimate.

Internal Controls

The audit team assessed internal controls and underlying principles to determine whether they were significant to the audit objective in accordance with GAO's *Standards for Internal Control in the Federal Government*.⁵³ The team concluded that three components and four underlying principles were significant to the audit objective. For each internal control component and underlying principle determined to be significant, the team performed steps to gain an understanding of internal controls. Table B.1 summarizes the significant internal control components and principles and any identified deficiencies in internal controls based on the audit work performed. These deficiencies are also presented in the Results and Recommendations section of this report.

⁵³ GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G, September 2014.

Table B.1. OIG Analysis of Internal Control Components and Principles Identified as Significant⁵⁴

Component	Principle	Deficiency identified by this report
Control environment	3. Establish structure, responsibility, and authority	OEHRM did not understand its reporting responsibilities for EHRM program-related IT infrastructure upgrade cost estimates.
Control activities	12. Implement control activities	OEHRM did not have an independent cost estimate performed and lacked procedures to maintain documentation to support cost estimate development and reporting LCCEs through congressionally mandated reports.
Information and communication	14. Communicate internally	OEHRM does not have formal agreements with OIT or VHA to ensure that all parties are aware of expected financial contributions.
	15. Communicate externally	VA did not report updates that accurately reflect estimated IT infrastructure costs in congressionally mandated reports.

Source: OIG analysis. The principles listed are numbered consistent with GAO Standards for Internal Control in the Federal Government.

Fraud Assessment

The audit team assessed the risk that fraud and noncompliance with provisions of laws, regulations, contracts, and grant agreements, significant within the context of the audit objectives, could occur during this audit. The team exercised due diligence in staying alert to any fraud indicators by

- soliciting the OIG’s Office of Investigations for indicators, and
- interviewing personnel and management from OEHRM and OIT to determine whether they knew of fraudulent activity or weakness that could potentially lead to fraud or that would affect the scope of this audit.

The OIG did not identify any instances of fraud or potential fraud during this audit.

Data Reliability

To assess the reliability of OEHRM’s data, the audit team interviewed OEHRM staff who were responsible for creating the cost estimates and performed some basic reasonableness checks of the data. For each cost estimate, the team requested supporting spreadsheets and documentation to trace dollar amounts from the cost estimate back to source data. However, the team was

⁵⁴ GAO’s *Standards for Internal Control in the Federal Government* lists five internal control components and 17 principles that provide the overall framework for establishing and maintaining an effective internal control system.

unable to conduct detailed testing to determine the extent of the reliability of the data because needed documentation was not provided for nearly all IT infrastructure cost categories.

In support of the December 2018 cost estimate, the OIG obtained a cost model created by a VA staff member no longer working at the VA. OEHRM stated this information was relied on significantly in developing of the initial estimate, but OEHRM did not maintain source information to support the cost model. The OIG was unable to interview the cost model creator to determine its reliability.

In support of the August 2020 cost estimate, the OIG obtained a cost model that provided greater detail for each IT infrastructure cost category on the methodology, assumptions, and amounts used to develop the updated estimate. However, the cost estimate still lacked the underlying data needed to support most cost categories and enable the team to perform detailed testing on the reliability of computer-processed data.

During the audit, the team confirmed with OEHRM leaders that they had provided all available supporting documentation for the LCCEs. However, the documentation provided was insufficient to assess the reliability of the computer-processed data. The team further determined, due to the wide range of data provided, that no alternate means existed to otherwise determine reliability, such as independently extracting source data from other systems. For example, the cost model provided to support the August 2020 estimate consisted of 81 spreadsheets derived from multiple sources and systems. Therefore, the team concluded the data provided to be of undetermined reliability. The team's determination was made based on guidance from GAO for assessing the reliability of computer-processed data in accordance with generally accepted government accounting standards.⁵⁵ Notably, these standards are different from VA and GAO guidance on the reliability of cost estimates. Despite the team's assessment that the computer-processed information is of undetermined reliability, the team concluded that the information was needed to address the audit objective and confirmed with OEHRM leaders that the information provided was used to develop the cost estimates.

As presented in finding 1 of this report, the team concluded that both cost estimates evaluated were not well-documented, comprehensive, or credible. This report finding, which identified that OEHRM lacked source documentation to support the estimates are reliable for cost-estimating purposes, further supports the team's determination that that underlying computer-processed data is of overall undetermined reliability. The team made recommendations in this report that are meant to improve the reliability of OEHRM's cost estimates and program data.

⁵⁵ GAO, *Assessing Data Reliability*, GAO-20-283G, December 2019.

Government Standards

The OIG conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that the OIG plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on audit objectives. The OIG believes the evidence obtained provides a reasonable basis for the findings and conclusions based on the audit objectives.

Appendix C: Management Comments

Department of Veterans Affairs Memorandum

Date: June 15, 2021

From: Executive Director, Office of Electronic Health Record Modernization (00EHRM)

Subj: Response to Draft Report “Unreliable Information Technology Infrastructure Cost Estimates for the Electronic Health Record Modernization Program” (Project Number 20-03185-R9-0003) (VIEWS 5075002)

To: Assistant Inspector General for Audits and Evaluations, Office of Inspector General (52)

1. Thank you for the opportunity to review the Department of Veterans Affairs Office of Inspector General (OIG) draft report “Unreliable Information Technology Infrastructure Cost Estimates for the Electronic Health Record Modernization Program.” The report contains two findings and six recommendations for the Office of Electronic Health Record Modernization (OEHRM).
2. I concur with the findings and recommendations in this report. I have included as attachments to this memorandum technical comments on the report and an action plan to address the recommendations.

The OIG removed point of contact information prior to publication.

(Original signed by)

John H. Windom

Attachments

Department of Veterans Affairs

Technical Comments

OIG Draft Report: “Unreliable Information Technology Infrastructure Cost Estimates for the Electronic Health Record Modernization Program” (Project Number 20-03185-R9-0003)

Date of Draft Report: April 21, 2021

Draft location: Page 6

Finding 1: OEHRM’s IT Infrastructure Upgrade Cost Estimates Were Unreliable but Process Improvements Were Made

Comment and justification: VA appreciates OIG’s acknowledgement of the improvements in the lifecycle cost estimate (LCCE) since the program’s inception.

OEHRM will continue to further refine its cost-estimating procedures in line with VA and OIG guidance and is willing to engage with OIG to facilitate better mutual understanding of the EHRM LCCE.

Draft location: Page 15

Finding 2: OEHRM Did Not Include All IT Infrastructure Upgrade Cost Estimates or Accurately Present Yearly Estimates in Congressionally Mandated Reports

Comment and justification: OEHRM will work with OM, OIT and VHA to incorporate all appropriate information technology infrastructure costs into the cost estimates delivered to Congress.

Office of Electronic Health Record Modernization (OEHRM)

Action Plan

OIG Draft Report: “Unreliable Information Technology Infrastructure Cost Estimates for the Electronic Health Record Modernization Program” (Project Number 20-03185-R9-0003)

Date of Draft Report: April 21, 2021

Recommendation 1: Ensure an independent cost estimate is performed for program life cycle cost estimates related information technology infrastructure costs.

VA Comments: Concur. OEHRM is coordinating with the Office of Management (OM) to ensure completion of an independent cost estimate for life cycle cost estimates that will include information technology infrastructure costs funded by the Office of Information and Technology (OIT) and the Veterans Health Administration (VHA).

Status: In Progress

Target Completion Date: This is part of the strategic review and will be provided as soon as information is available

Recommendation 2: Reassess the cost estimate for Electronic Health Record Modernization program-related information technology infrastructure and refine as needed to comply with VA’s cost-estimating standards.

VA Comments: Concur. VA will ensure compliance with VA financial policy, the VA Cost Estimating Guide and GAO-20-195G, Cost Estimating and Assessment Guide to assess its cost estimating standards and, upon completion of the independent cost estimate of the Electronic Health Record Modernization (EHRM) program, reassess and refine its own cost estimate for the EHRM program. In the interim, as infrastructure in additional medical centers is upgraded to support the electronic health record (EHR) deployment, the cost estimating team will continue to gather data to further refine its cost estimate.

Status: In Progress

Target Completion Date: This is part of the strategic review and will be provided as soon as information is available

Recommendation 3: Develop procedures for cost-estimating staff that align with VA cost-estimating guidance.

VA Comments: Concur. OEHRM will continue to refine its internal cost estimation procedures in compliance with VA financial policy, the VA Cost Estimating Guide and GAO-20-195G, Cost Estimating and Assessment Guide. The OEHRM LCCE Management Plan will be published to document these changes.

Status: In Progress

Target Completion Date: Under active revision as part of the strategic review and will be provided as soon as information is available

Recommendation 4: Ensure costs for all information technology infrastructure upgrades funded by the Office of Information and Technology and the Veterans Health Administration or other sources needed to

support the Electronic Health Record Modernization program are disclosed in program life cycle cost estimates presented to Congress.

VA Comments: Concur. OEHRM is coordinating with OIT and VHA to ensure that the costs for all information technology infrastructure upgrades are collected and included in program life cycle cost estimates for presentation to Congress.

Status: In Progress

Target Completion Date: This is part of the strategic review and will be provided as soon as information is available

Recommendation 5: Formalize agreements with the Office of Information and Technology and the Veterans Health Administration identifying the expected contributions from each entity toward information technology infrastructure upgrades in support of the Electronic Health Record Modernization program.

VA Comments: Concur. OEHRM will formalize and sign agreements with OIT and VHA identifying their expected contributions towards information technology upgrades in support of the EHRM program for the life of the program.

Status: In Progress

Target Completion Date: This is part of the strategic review and will be provided as soon as information is available

Recommendation 6: Establish procedures that identify when life cycle cost estimates should be updated and ensure those updated estimates are disclosed in the program's congressionally mandated reports (CMR).

VA Comments: Concur. As established in OEHRM's Life Cycle Cost Estimate Management Plan, OEHRM updates the LCCE in accordance with the federal budgeting process. For example, the LCCE is updated with actuals from the prior fiscal year, with enacted budget, with a President's budget request, and during passback. The LCCE is also updated to reflect alignment with a major shift in schedule and/or strategy to the 10-year wave deployment plan. The revised LCCE is then disclosed in the program's subsequent quarter Congressionally Mandated Report.

Status: In Progress

Target Completion Date: This is part of the strategic review and will be provided as soon as information is available

For accessibility, the original format of this appendix has been modified to comply with Section 508 of the Rehabilitation Act of 1973, as amended.

OIG Contact and Staff Acknowledgments

Contact	For more information about this report, please contact the Office of Inspector General at (202) 461-4720.
----------------	---

Audit Team	Jessica Blake, Director John Cefai Kristi Corthell Francis Hoang Loi Pham
-------------------	---

Other Contributors	Dyanne Griffith Charles Hoskinson
---------------------------	--------------------------------------

Report Distribution

VA Distribution

Office of the Secretary
Veterans Benefits Administration
Veterans Health Administration
National Cemetery Administration
Assistant Secretaries
Office of General Counsel
Office of Acquisition, Logistics, and Construction
Board of Veterans' Appeals
Executive Director, Office of Electronic Health Record Modernization

Non-VA Distribution

House Committee on Veterans' Affairs
House Appropriations Subcommittee on Military Construction, Veterans Affairs,
and Related Agencies
House Committee on Oversight and Reform
Senate Committee on Veterans' Affairs
Senate Appropriations Subcommittee on Military Construction, Veterans Affairs,
and Related Agencies
Senate Committee on Homeland Security and Governmental Affairs
National Veterans Service Organizations
Government Accountability Office
Office of Management and Budget

OIG reports are available at www.va.gov/oig.