OSDH Looks to Modernize Future of Public Health Surveillance

Introduction

Public Health Investigation and Disease Detection of Oklahoma (PHIDDO) is the current system the Oklahoma State Department of Health (OSDH) uses for real-time public health surveillance. While PHIDDO provides a centralized reporting system for diseases and outbreaks, even with maintenance, support, and expanded capabilities, the PHIDDO system is outdated and needs to be replaced.

As described by the World Health Organization, public health surveillance is the "continuous, systematic collection, analysis, and interpretation of health-related data." WHO goes on to tell us "Disease surveillance data serves as an early warning system for impending outbreaks that could become public health emergencies; enables monitoring and evaluation of the impact of an intervention; helps track progress towards specified goals; and monitors and clarifies the epidemiology of health problems, guiding priority-setting, and planning and evaluation public health policy and strategies."

> **"In public health, we can't do anything without surveillance. That's where public health begins."**
>
> — David Satcher, M.D., Ph.D., Director,
> Centers for Disease Control and Prevention, 1993–1998

The PHIDDO system is a custom-built, web-based application for disease management, surveillance activities, and HIV treatment and care. The system offers real-time reporting of communicable diseases and outbreaks and is only accessible to persons with specific authorization to enter and view records and information. In addition, the application offers flexible authorization options to further control the end user's ability to view and interact with sensitive data. Online case reporting reduces paperwork by eliminating the need for faxing and mailing reports to OSDH. PHIDDO provides a centralized system for these reports, while also offering the ability to search and update previously submitted reports.

Title 63 Oklahoma Statute (O.S.) 1981 § 1-503 mandates that Oklahoma health care providers and laboratories report cases of diseases and conditions to OSDH, and PHIDDO is the preferred method of doing so. The only exception currently is COVID-19 reporting, which occurs through the SpringML web portal and via the OSDH Case Investigation (OSDH CI) application. PHIDDO is not a single application, but a system of systems using interoperability (refer to Diagram 1). It interfaces with OSDH CI, as well as many other applications, and is a Tier-1 system for OSDH, meaning there would be a substantial impact on OSDH services if there were PHIDDO disruptions or outages.

There are currently about 800 users that utilize PHIDDO including internal OSDH staff, county health department and tribal health staff, physicians, physician assistants, nurse practitioners, contractors, case managers, infection preventionists, laboratorians, sentinel providers, and other clinical or health care professionals that would submit cases of reportable diseases and conditions or conduct disease investigations.

History of PHIDDO and where we are today

PHIDDO was originally developed over a period of years from August 2003 to August 2011 in partnership with a consulting company. Disease Management and Case and Contact Investigation are the largest parts of the capability in PHIDDO. Modules of functionality and interoperability were added over time. The AIDS Drug Assistance Program (ADAP) and Ryan White Care project was one of the most recent programs to be added. The pandemic highlighted deficiencies that required expansion with Case Investigation and Contact Tracing (OSDH CI & CT) and exposed the pressing need for a modernized public health surveillance platform.

While replacement discussions and decisions are underway and implemented, we must take action to ensure the current system and the many related crucial integrations stay viable and compatible with modern technology. With Microsoft's Silverlight end-of-life (EOL) and Internet Explorer (IE) sunset, immediate attention is on PHIDDO security and supportability. The Silverlight EOL is not a surprise given Microsoft's original notification of these timelines back in 2011. Silverlight's EOL was Oct. 12, 2021, which means it has not received quality or security updates since that date and is completely out of support. IE's sunset date was June 15, 2022. OSDH could potentially face a scenario where Silverlight vulnerabilities are exploited, resulting in the need to immediately turn off its use resulting in PHIDDO disablement. To manage this risk, OSDH is implementing a phased solution.

Goal 1

Zscaler implementation

Phase 1 removes the public-facing instance of PHIDDO and adds front-end protection with Zscaler Private Access (ZPA). An additional 800 Zscaler user licenses, at a cost of about $69,500 for year one, were purchased and are in the process of implementation. This effort will take approximately four months.

Goal 2

OpenSilver implementation

Phase 2 implements UserWare OpenSilver as the back-end toolset to render PHIDDO webpages and allow for the complete removal of Silverlight. OpenSilver is a product that replaces the out-of-support Silverlight plug-in with supported technologies and prevents the need for the plug-in. OpenSilver is a run-time replacement for Silverlight. This would allow the application to continue running indefinitely and would also be more secure and usable in modern browsers.

Benefits:

- Relatively low cost to have the UserWare OpenSilver team modify the back-end code compared to a complete rewrite of PHIDDO. The UserWare development and implementation cost are about $452,000.
- The speed of the development cycle is accelerated since we do not have to modify the PHIDDO source code, and this effort could be concurrent with the Zscaler implementation and current operations. This effort will take approximately 12 months.
- PHIDDO could be used in modern web browsers.
- PHIDDO is more secure. OpenSilver passed the OMES Security and Architecture reviews.
- Eliminates the potential risk of PHIDDO not working since Silverlight is unsupported and IE is discontinued.
- Allows OSDH to realize the correct replacement solutions for PHIDDO in a manageable timeframe and in a controlled state versus an emergency state.
- Eliminates the need for the PHIDDO Zscaler ZPA front-end solution and the overhead that goes along with supporting this solution. This allows OSDH to stop using the 800 licenses implemented in Phase 1 and enables PHIDDO to run in all modern browsers with very little to no changes to the main source code.
- Support and enhancements of PHIDDO can continue without disruptions, so the current development pipeline is not impacted.

Identified Risks:

- Many systems within PHIDDO could take a long time to replace or might need a custom solution.
- PHIDDO could stop working at some point depending on circumstances out of our control before every solution needed to implement is available or realized.
- Staff and program areas could lose valuable knowledge and data.

Goal 3

Long-term solution – replace PHIDDO

OSDH is looking to replace PHIDDO in the next three years, taking a hybrid approach of selecting several commercial-off-the-shelf products for specific capabilities and utilizing customizations for required interfaces. There is nothing on the market that includes all the capabilities in PHIDDO, thus several products will be selected (refer to Diagram 2).

OSDH was working with Inductive Health, an implementer and host of the National Electronic Disease Surveillance System (NEDSS) Base System (NBS), a CDC-developed integrated information system, for over a year to implement NBS. At the end of 2021, Inductive Health agreed with OSDH leaders that NBS is not a fit for how OSDH does business. Moving to NBS would cause material issues and, in some cases, a reduction in capability. The Inductive Health NBS agreement was discontinued in October 2022.

Many options have been considered over the past few years. OSDH is preparing a request for proposal (RFP) for the surveillance system replacement. Groupware Provide is a new application selected through RFP for the Ryan White Care; ADAP; and HIV Counseling, Testing and Referral Program capability currently in PHIDDO. OSDH CI will be supported and enhanced until a surveillance system is selected and implemented.

The lack of a fully functional surveillance system will cause delays in reporting and the detection of outbreaks, which could result in additional and preventable cases of illness, hospitalizations and deaths. Replacing the current system will help OSDH meet its mission to protect and promote health, prevent disease and injury, and cultivate conditions by which Oklahomans can thrive.

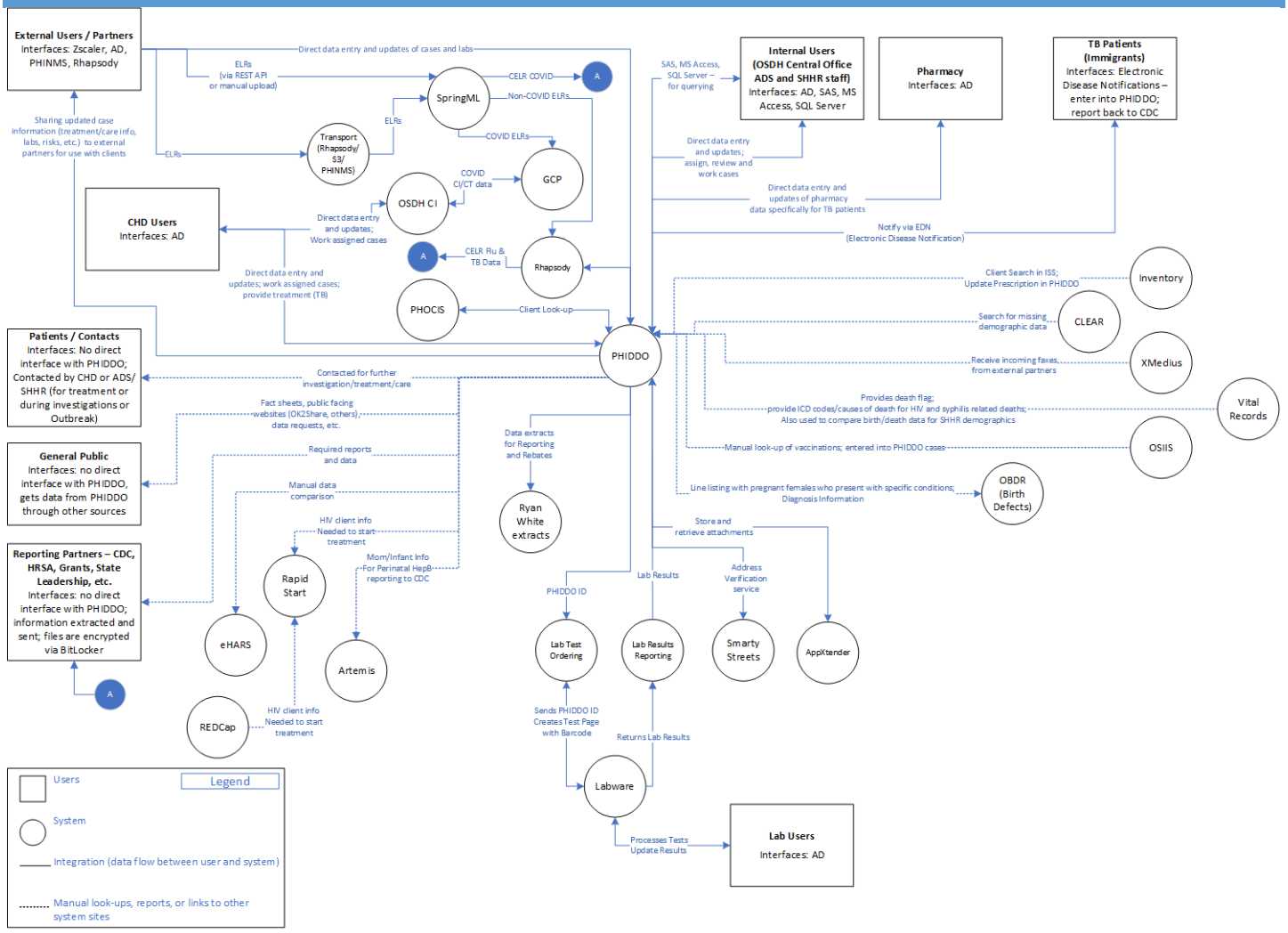

Diagram 1: PHIDDO Interoperability

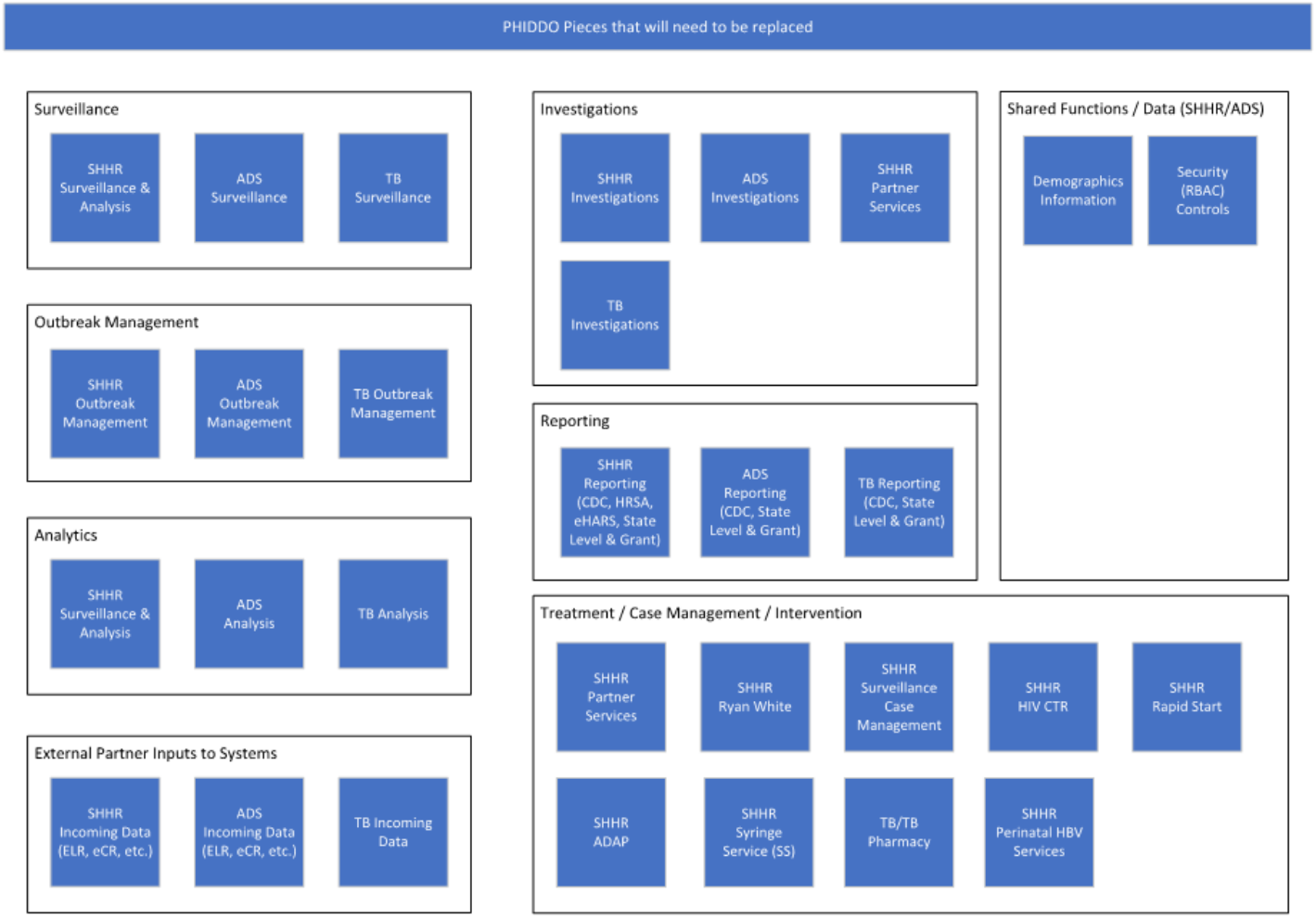

Diagram 2: Surveillance System Replacement