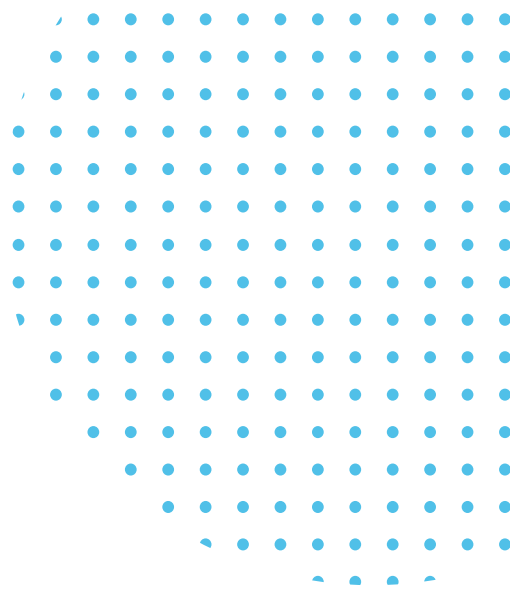


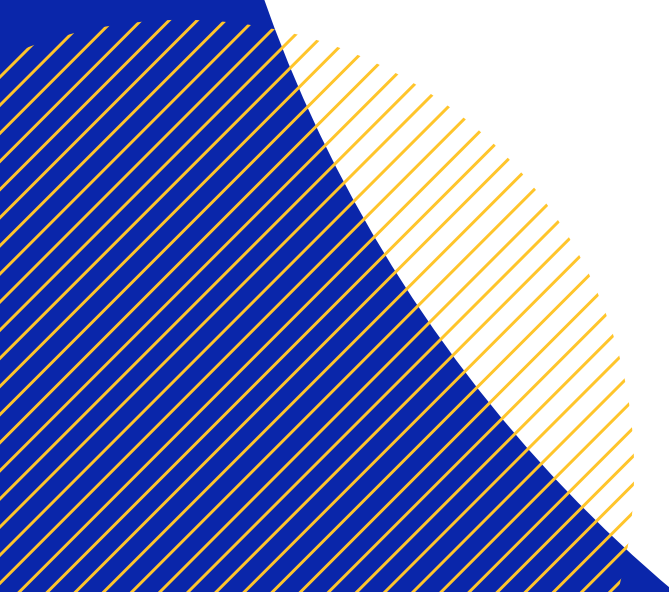


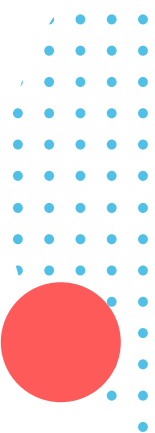
HIMSS™



# ***Public Health Information and Technology Infrastructure Modernization Funding Report***

Core Investment Strategies to Modernize and Interoperate  
Federal, State, Local, Tribal Public Health Systems





## Executive Summary

The top priority of all governments and healthcare organizations in improving their response to the pandemic is learning how to mitigate the further spread of COVID-19 through modern data systems and global policy efforts. COVID-19 has exposed deadly gaps in our nation’s public health data infrastructure and emphasized the need to build a robust public health surveillance system that detects and facilitates the immediate response to and containment of emerging health threats.

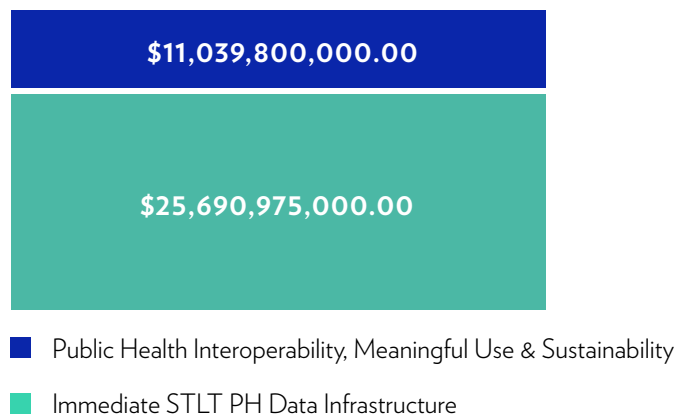
The global health community has also been proactive in implementing new processes and protocols in response to the COVID-19 pandemic. For instance, CDC’s Data Modernization Initiative (DMI) is a multi-year, billion-plus dollar effort to modernize core data and surveillance infrastructure across the federal and state public health landscape. However, Public Health in the US is inherently state and local and is often siloed and fragmented. **HIMSS recommends approximately \$36.7 Billion investment to digitize, modernize and interoperate state, territorial, local, and tribal (STLT) public health data infrastructure over the next ten years.** STLTs require a significant investment to maintain the software, hardware, workforce, licensing sustainably, and technical support to transmit vital health data electronically to public health agencies. Moreover, STLTs are one of the primary partners required to analyze health data and share insights with federal agencies, healthcare facilities, and health data exchanges throughout the United States to address existing or future health threats and support meaningful use.

In a rigorous interview and vetting process with members of the hospital CIOs, local public health agency leaders, market suppliers, and other trusted industry experts, HIMSS identified the

need for long-term sustainable funding for STLTs to digitize/modernize systems to electronically receive, analyze, and share data insights. The ten-year investment strategy will also develop the local public health informatics workforce and systems compatibility required to support the following essential public health functions and modernization priorities:

- Electronic Case Reporting and Contact Tracing
- Syndromic Disease Surveillance
- Nationwide Notifiable Disease Surveillance
- Vital Records Reporting
- Electronic Laboratory Results Reporting
- Immunization Registry Reporting and Query
- Health IT Innovations and Workforce Capacity
- Trusted and Secure Access to Multi-Modal Health Data
- Establish a Nimble Rapid Cycle Learning Health System
- Interoperable Platforms to Facilitate Broad-based Data Exchange
- Ongoing Licensing Costs, Software Updates, Hardware Updates

**Figure 1. Proposed 10-Year Investment for Meaningful Use & Sustainability Funding \$36,730,775,000**



*HIMSS CALLS ON CONGRESS AND THE DEPARTMENT OF HEALTH AND HUMAN SERVICES TO PROVIDE THE NECESSARY INTEROPERABLE TECHNOLOGY (HARDWARE AND SOFTWARE) TO RECEIVE PUBLIC HEALTH DATA (AS DEFINED BY THE PROMOTING INTEROPERABILITY PROGRAM) AND OTHER DATA REQUIRED TO PERFORM CRITICAL PUBLIC HEALTH TASKS WITH HEALTH SYSTEMS.*

## Background

HIMSS provides public policy and guidance on the core investment strategies that support health system transformation and public health data modernization based on lessons learned from the COVID-19 pandemic. This guidance builds upon strategic goals outlined in the 2020 [HIMSS COVID-19 Global Policy Call to Action](#) and emphasizes the public policy and business processes that must transform in order to securely transmit bi-directional reports electronically to public health agencies, healthcare facilities, and health data exchanges in the US As recommended in the HHS Report [Public Health 3.0: A Call to Action to Create a 21st Century Public Health Infrastructure](#), we need to develop timely, locally relevant health information systems across state, territorial, local and tribal (STLT) governmental health agencies. STLTs rely on outdated data, merged across years to improve sample size, and these data are often not actionable at the neighborhood level. While the US HHS, via the CDC and ONC, provides strong influence, funding, and technical guidance, these federal agencies are historically limited in how Congress allocates funding to the CDC for public health agencies at the STLT level to use.

Since 1980, the US Department of Health and Human Services has established 10-year, evidence-based national priorities and objectives called Healthy People to improve health. For this decade, Healthy People 2030 sets data-driven national objectives to improve health and well-being over the next decade. Healthy People 2030 features strategies to help the United States become more resilient to public health threats like COVID-19 and leverage health IT and data systems to achieve these goals. Healthy People 2030 focuses on helping healthcare providers and patients leverage digital tools to guide the United States in improving health and well-being.

In alignment with many of the Healthy People 2030 goals, the *Public Health Data Modernization Initiative (DMI)*, launched by the CDC, seeks to transform methods for the collection, use, and sharing of data through modern IT capabilities. The DMI proposes to address the following key questions:

- How do we improve the timeliness and quality of data?
- How can we better coordinate data activities and systems?
- How can we reduce the burden on data partners?
- How can we integrate emerging technologies more effectively?

The public health informatics community supports the CDC's DMI Initiative through the Data: Elemental to Health campaign advocacy efforts. The campaign comprises a broad-based coalition of healthcare and public health organizations, which aims to secure federal funding for federal, state, local, tribal, and territorial health departments (STLTs). Specifically, the campaign supports building the coordinated and expanded public health surveillance capacity. The public health data infrastructure requires a seamless and interoperable framework that automatically draws information from the healthcare system and reports it to public health agencies. Thus, the Data: Elemental to Health Campaign urges Congress to (at minimum) provide \$1.57 billion per year to support consistent, ongoing modernization of the public health data infrastructure at the state and local levels.

The CDC has begun targeting investments across three priority areas:

1. Data sharing across the ecosystem,
2. Enhancing CDC services and systems for ongoing data modernization, and
3. New standards and approaches for public health reporting.

*All efforts towards the DMI must command a comprehensive agency-wide focus to improve HHS enterprise IT infrastructure at all levels. This cannot be done through a programmatic funding strategy, and HHS led by the ONC, should remove artificial boundaries. The prevailing pandemic shows us that we still have not properly captured and emphasized inter-agency connectivity.*

These priority areas support core public health functions and help policymakers assure that timely, correct data can be leveraged to address health equity issues and enact policies and provisions that address social determinants of health. By investing in these three areas, CDC is working toward a system that can be scaled nationwide and adapted as needed and technology evolves.

However, given the programmatic approach to health IT infrastructure development in support of STLT improvements, many STLT funded systems are evolving without the true benefit of an enterprise approach. For example, CDC's data modernization initiative is primarily driven by the Center for Surveillance, Epidemiology, and Laboratory Services (CSELS). Conversely, CSELS is not responsible for immunization information systems (IIS), resulting in a gap in coordinated modernization efforts.

This report includes resources to standardize and interoperate IIS at the STLT level. There are several cities and county-based IIS (ex. New York City, Philadelphia, Chicago, San Diego, and San Joaquin). The American Immunization Registry Association counts 64 IIS in all. Also, there is no common infrastructure at the state level. Thus, IIS systems must be updated to align with broader health IT standards to ensure interoperability with all authorized public and private users.

The priority areas for modernization in the next 1-5 years would build a foundation of interoperable platforms to facilitate broad-based data exchange that includes:

- Immunization Information Systems and Registry Reporting & Query
- Syndromic Disease Surveillance Reporting
- Electronic Case Reporting and Contact Tracing
- Nationwide Disease Surveillance and Reporting
- Vital Records Reporting
- Electronic Reportable Laboratory Results Reporting

- Local Public Health Informatics Workforce and Systems Compatibility
- Trusted and secure access to multi-modal health data across virtual, remote or in-person services

Modernization must also include the following recommended programs and resources for meaningful and sustained system transformation by 2030:

- Establish a nimble rapid cycle learning health system environment (analytics, strategic coordination, and policy development)
- Improve health IT innovations and workforce capacity to support cross-sector data analytics, visualization, reporting, and care coordination platforms
- Build a foundation of interoperable platforms to facilitate broad-based data exchange, health data analysis, visualization, and reporting

*HHS MUST ALSO CONSIDER THE TRENDS OVER THE PAST 5-10 YEARS WITHIN STATES AND LARGE MUNICIPALITIES WHEREBY STAFFING FOR IT PULLED OUT OF THE DEPARTMENT AND UP TO THE STATE LEVEL. THE DISTANCING OF IT SUPPORT HAS MADE IT HARDER TO GET THE KINDS OF DATA, RESOURCES, SKILLS, AND POLICY ACTION NEEDED TO EFFECTIVELY ADDRESS MODERN HEALTH THREATS IN A TIMELY MANNER.*

## Baseline Funding Assessment

Public health agencies must prioritize the digitization of essential services at all levels. Legacy technology and policies (e.g., remote working, issuing devices) must be updated to respond to modern, electronic data processes. Moreover, comprehensive cross-agency strategies should be employed to address current Band-Aids across agencies taking a siloed approach to modernization of services. This means that STLTs will need to realize an enterprise strategy considering both the hardware and software functionality than the staffing expertise to leverage these modern data solutions and approaches, keeping in mind the legal requirements of the state and federal guidelines.

To calculate a baseline of investments needed to modernize and transform public health systems, HIMSS considered determining factors to arrive at baseline costs for 21st-century public health system transformation and data modernization among governmental health agencies. Defining the universe of funding across all HHS systems.

1. What is currently being spent?
2. What is needed (short-term)?
3. What is needed (long-term)?
4. What role can HHS/ONC/CDC/CMS/HRSA/ASPR play in an enterprise modernization approach?
5. What is needed to determine a common standard of public health data infrastructure?
6. What infrastructure already exists (e.g., the role of HIEs, state health IT roadmaps, emergency preparedness plans, etc.)?
7. What are the connections with other organizations, e.g., State Medicaid?

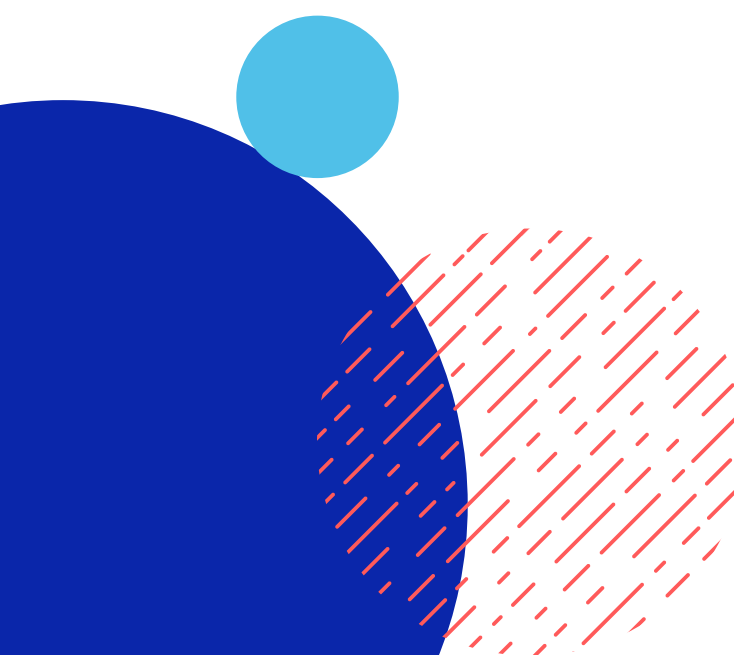
To calculate a baseline of investments needed to modernize and transform public health systems, HIMSS considered determining factors to arrive at baseline costs for 21st-century public health system transformation and data modernization among governmental health agencies. Defining the universe of funding across all HHS systems.

There are approximately 3,000 local health departments in the United States (National Association of County & City Health Officials) coupled with 50 state departments of health, eight territories, and the District of Columbia. Through interviews with the Data: Elemental to Health Campaign partners and other key stakeholders at state and local public health agencies, health systems, market suppliers, and interoperability experts, HIMSS has developed estimates for price points on salaries, hardware, software, licensing, training, and additional anticipated costs. The bulk of resources required to modernize the US public health system and associated essential services must be allocated to local governmental health agencies.

The capacity to respond to health acute health threats and chronic health conditions alike resides in the ability of STLTs to shed analog and antiquated systems and adopt digital tools that support the quadruple aim and 10-year health objectives set by federal and academic partners and conferred and implemented by STLTs. HIMSS has assessed the core funding (including labor and system costs) required to digitize and modernize essential and emergency public health and healthcare services as follows:

<b>Table 1. STLT Essential Services Prioritized for Digitization and Modernization (Year 1-5)</b>		
State	Electronic Case Reporting and Contact Tracing	\$ 72,500,000
State	Syndromic Disease Surveillance Reporting	\$ 250,000,000
State	Nationwide Disease Surveillance	\$ 393,750,000
State	Vital Records Reporting	\$ 305,025,000
State	Electronic Laboratory Results Reporting	\$ 162,500,000
State	Immunization Information System Reporting and Query	\$ 507,200,000
Local	Combined Totals for Local Essential Services) Syndromic disease surveillance, electronic case reporting, contact tracing, vital records reporting, electronic labs, IIS reporting, and query, disease surveillance	\$ 22,200,000,000
Local	Essential Local PH Workforce	\$1,800,000,000
<b>Total Estimated Funding</b>		<b>\$25,690,975,000</b>

The essential services outlined in Figure 1 detail the evaluation, digitization, and implementation costs. The data also supports the initial human resources needed to modernize these services.



# Recommendations for Implementation (Years 1-5)

Beginning now and over the next five years, US health systems must realize critical improvements related to the current public health emergency response. These improvements are underway and are represented in the **\$25,690,975,000** estimate above. The essential services outlined encompass both evaluation and digitization of services and support the initial human resources needed to modernize these services.

For example, an investment of \$50 million in Fiscal Year (FY) 2020 marked the start of the Data Modernization Initiative (DMI) at the CDC. With \$50 million in FY 2021, \$500 million in the CARES Act, and approximately \$300 million in the American Rescue Plan Act, DMI is beginning to build a standards-based, interoperable public health information ecosystem ready to confront any emerging threat.

Significant and sustained funding is needed so jurisdictions can confidently invest in the systems and workforce they need to bring their data

systems into the 21st century. It will take time and continued funding to support the critical investments and to ensure data delivery and collection address health equity. HIMSS, a member of the Data: Elemental to Health Campaign, is grateful to Congress and the Administration for recognizing this need and supporting these early investments.

While the Data: Elemental to Health funding plan supports current DMI efforts underway, HIMSS also notes the need to advance transformation across the US health system enterprise. It is crucial that we seriously invest in new technology in every jurisdiction and attract, train, and retain the diverse workforce needed at the state, local, tribal and territorial levels to build, implement and sustain a modern public health data infrastructure that will allow for secure bi-directional exchange across the US.

*HIMSS supports the Data: Elemental to Health Campaign in urging Congress to (at minimum) provide \$1.57 billion per year to sustain data modernization of our public health data infrastructure at the STLT levels.*

The foundation of the DMI is built on a set of guiding principles: an enterprise approach to data exchange, interoperability between public health and health care systems, security to protect patient data, a workforce empowered to build and maintain the systems, and public-private partnership to drive innovation.

In addition to the baseline figures detailed in the section above, the following estimations support the DMI goals for interoperating, integrating, and securing critical public health systems. These estimates also take into account the health system transformation needs to align public health and clinical systems and the associated workforce development and training costs.

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### **Additional STLT Resources Needed to Interoperate Essential PH Systems in Response to the Pandemic and the CDC's DMI Objectives**

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**HIMSS supports the following recommended funding and technical assistance goals outlined by the Data: Elemental to Health Coalition in addition to the \$25,690,975,000 estimate:**

**ELECTRONIC CASE REPORTING & CONTACT TRACING:** Electronic Case Reporting (eCR) is the automatic submission of disease reports directly from electronic health records (EHR) at clinical care sites to state, territorial, local, and tribal health departments. eCR connects clinical and public health data to improve data completeness—ensuring that public health has the race and ethnicity data critical for achieving equity in our response.

Moreover, governments at all levels should immediately consider the engagement and

deployment of mobile or digital contact tracing applications that can help expedite outbreak management and response, including hot-spotting; and that support the development of vital information at the community level, including:

1. The daily number of cases
2. The number of contacts identified
3. To determine how quickly patients are isolated, and contacts are notified and advised to stay home, self-monitor, and maintain social distance from others
4. To inform human services and social support systems to assist the most vulnerable
5. To inform and support data analytics for informed policymaking at all levels of government

*Hiring epidemiologists and building systems to manage eCR requires at least \$656 million over five years, of which \$336 million are human costs and \$320 million are for systems. An additional \$100 million is included for secure, connected electronic tracing applications and tracing analytics workforce capacity.*

**SYNDROMIC SURVEILLANCE:** Syndromic surveillance uses near real-time data collection from hospital emergency department visits and other data sources such as urgent care centers, poison center calls, or emergency medical service runs for continuous monitoring of community health. Data from both inpatient encounters and intensive care unit admissions are also needed for public health.

*Implementing syndromic surveillance systems requires \$310.4 million over five years, of which \$86.4 million are human costs and \$224 million are for systems.*

*STLTS MUST BE EQUIPPED TO ANALYZE AND SHARE ELECTRONICALLY TRANSMISSIBLE VISUALIZED DATA AND INSIGHTS WITH ELIGIBLE HOSPITALS. SUPPOSE WE DO NOT DEVELOP THE INFRASTRUCTURE TO RECEIVE AND ANALYZE THE DATA THAT THE FEDERAL GOVERNMENT REQUIRES OF STLT PUBLIC HEALTH AUTHORITIES AND HEALTHCARE SYSTEMS TO COLLECT AND REPORT. IN THAT CASE, WE LOSE ANY VALUE THAT COULD BE GAINED FROM CORE LESSONS LEARNED FROM THE COVID-19 RESPONSE AND DATA COLLECTION.*



## NATIONWIDE NOTIFIABLE DISEASE SURVEILLANCE (NNDSS) and Reporting:

The NNDSS collects, aggregates, and analyzes at the national level de-identified data from all individual cases of reportable diseases and conditions from state, territorial, local, and tribal public health agencies reported by hospitals, health care providers and laboratories. NNDSS requires rapid electronic data streams from health departments to aggregate national data for decision-making and is a critical component of public health response.

*Bringing NNDSS into the 21st century requires \$1.24 billion over five years, of which \$280 million are human costs, and \$960 million are for systems.*

**ELECTRONIC VITAL RECORDS:** The electronic vital records system provides a secure electronic collection of birth and death data from hospitals, funeral homes, health care providers, and medical examiners. Electronic death registration systems (EDRS) provide timely mortality data. Our vital records systems are in dire need of upgrades to be interoperable with public health and EHR data systems. They are often funded through departments outside the public health department. Funding and action coordination across state and local departments is essential to the successful collection of eVital Records collection and transmittal.

*Modernizing vital records systems requires \$688 million over five years, of which \$336 million are human costs and \$352 million are for systems.*

**LABORATORY INFORMATION MANAGEMENT SYSTEMS:** LIMS forms the backbone for laboratory data collection, analysis, management, and sharing. Electronic Laboratory Reporting (ELR) and Electronic Test Ordering and Reporting (ETOR) support the automated electronic transmission of laboratory results from commercial and hospital laboratories to public health departments. ETOR facilitates the collection of complete demographic information so that laboratories can report complete data and results to public health.

*Putting LIMS, ELR, and ETOR in place requires \$1.032 billion over five years, of which \$392 million are human costs and \$640 million are for systems.*

## Immunization Information System (IIS) Reporting and Query:

Immunization Information Systems are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area. All states, DC, Territories and Freely Associated Countries, and some large municipalities and counties operate an IIS (64). IIS have been operational for more than 25 years and are in need of modernizing the system's architecture to increase efficiencies and meet the demands of public health and the broader health IT ecosystem while exchanging immunization data in near real-time with hundreds of thousands of providers, payers, and other stakeholders.

*Modernizing STLT Immunization Information Systems over three years would require an initial investment of \$499 million and a subsequent investment of approximately \$1.8 billion. \$1.4 billion of this total represents human costs, while the remaining represents system and technology costs.*

**Funding Estimate: ~\$5,138,400,000 Billion**

## Improve Health IT Innovations and Workforce Capacity to Support Cross-Sector Data Analytics, Visualization, Reporting, and Care Coordination Platforms

**Funding Recommendations:** The success of our nation's health system transformation efforts hinge on a well-trained healthcare workforce. As public health and healthcare delivery become even more data-driven and analytically focused, our workforce needs to support the development of more technologists, data scientists, strategists, epidemiologists, and informaticists.

STLTs need to nurture a labor force that can use analytical methods and leverage cross-sector data, thus informing evidence-based policymaking. This shift also calls for training, peer exchanges, and the creation of new apprenticeship programs to ensure that we are producing a skilled labor force that public health agencies and health care employers need. A highly trained workforce provides the backbone

for the healthcare transformation efforts underway and is what our nation will require in the future.

We recommend that HHS and STLTs focus on the following topics to help develop a skilled healthcare workforce:

- Provide seed funding for industry intermediaries to develop innovation challenges and increase scholarships for [STEM](#) and [STEAM](#) programs. Establish apprenticeship programs targeted at analytical and data-driven healthcare professions, care settings, and state agencies with the most significant health IT workforce needs.
  - > **2 year x \$200 mil/year workforce program = \$400 mil**
- Provide incentives that support coordination among state, regional, and local public entities and public institutions of higher education. Informatics fellows, students, and public health officials can access and share this data, including open data, across all levels of government to improve the efficiency and efficacy of services, improve social determinants of health outcomes and promote data-driven policymaking, decision making, research and analysis similar to the [Virginia Open Data Portal](#) and the [Indiana Data Hub](#).
  - > **2-year loan forgiveness incentive program @ \$100 mil for STLT public health department program data analytics, epidemiology, informatics staff = ~\$400 mil**

**Funding Estimate: ~\$846,400,000 mil**

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### Trusted and Secure Access to Multi-Modal Health Data Across Virtual, Remote, or In-person Services

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**HIMSS Recommendation:** Establish equitable financial supports and incentives to connect with health information exchanges; implement and adopt health IT solutions using incentives, standardized processes, and specific data standards for providers to collect and exchange demographic,

personal health, and social information. STLTs should also be proactive in advancing a scalable data-sharing platform that leverages core data services and existing STLT IT infrastructure in a zero-trust environment vital to health system modernization efforts.

As outlined in President Biden’s executive order on “Improving the Nation’s Cybersecurity,” STLTs should also apply the latest data encryption standards, particularly as governmental health organizations move towards cloud-based services and will be increasingly required to thwart cyberattacks on agencies, which hold valuable health information.

Moreover, STLTs will need to adopt specific consent forms and processes across all providers, community-based organizations, and state and local agencies that enable STLTs to authorize the exchange of health and social data between partners. This also means coordinating with federally funded health systems to leverage the shared funding to ensure broad compliance. Additionally, STLTs need funding to ensure the public can access virtual and remote services, including high-speed broadband and ongoing reimbursement of virtual health services across the spectrum of care, and accelerate opportunities for digital health equity.

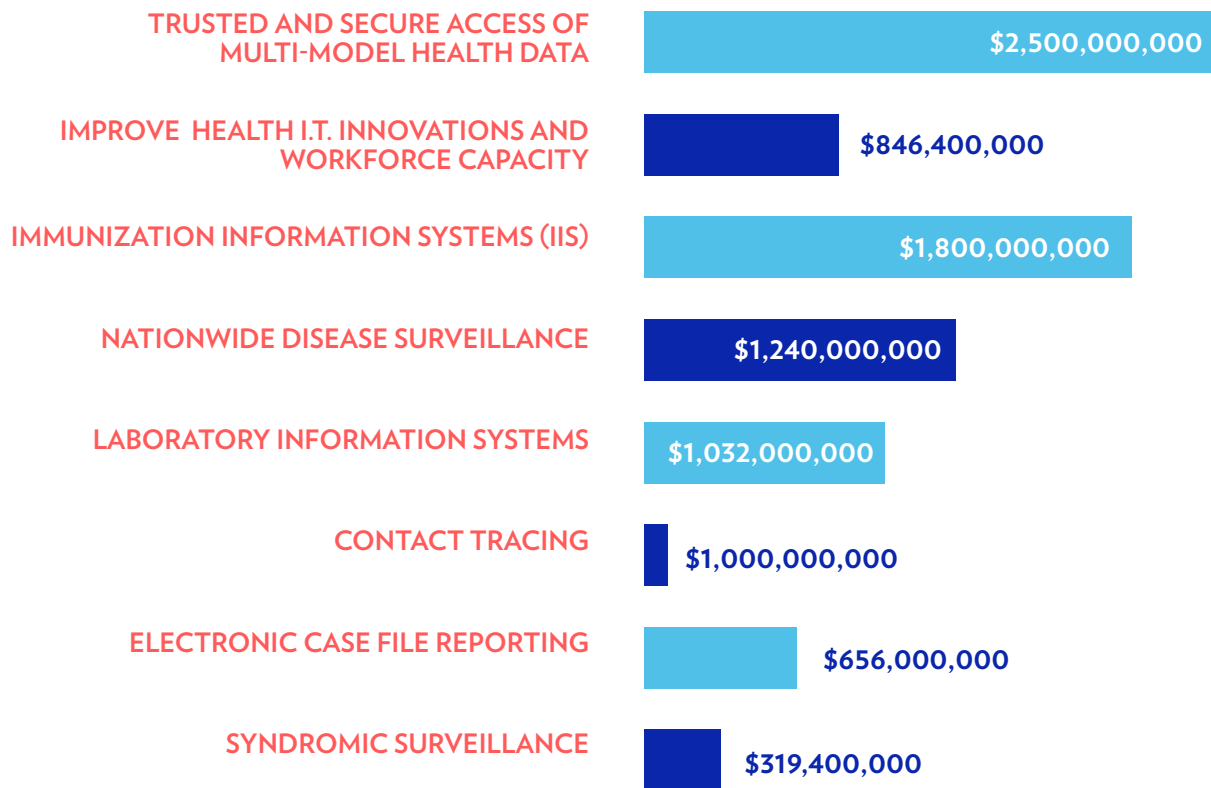
HIMSS recommends at least a \$2.5 billion investment for privacy, security, and cybersecurity modernization over the next five years to help implement STLT governmental health agency modernization and system transformation.

**Funding Estimate: ~\$846,400,000 mil**

(Figure 2., next page)



## Figure 2. Proposed Funding for PH Interoperability and Meaningful Use (Year 2-10) - \$11,039,800,000



# Long-term Recommendations Supporting Optimization and Sustainability (Years 2-10)

**Figure 3. 10-Year Sustainability Investments for PH Modernization - \$2,555,000,000**



Other considerations described in the HIMSS COVID-19 Global Call to Action and from the public policy stakeholder feedback on the required modern functionality to support interoperable exchange and cross-sector solutions among public health and healthcare systems:

**Establish a Nimble Rapid Cycle Learning Health System Environment (analytics, strategic coordination)**

**Funding Recommendation:** Provide sustained funding to advance a [Public Health 3.0](#) environment across state and local levels to

modernize the public health system to better adapt to shifting public health and health care changes over time. This flexibility must assume ongoing strategic coordination between STLTs public health systems, healthcare providers, and federal agencies to meet emergency health priorities as well as routine essential services and functions. Specifically, we would like to see an integrated funding mechanism (coordinated funding alignment across all HHS funding programs – including CMS) that would support a public health IT strategist (1 FTE/State) to work as or with state health IT coordinators, CDC, ONC, and other public and private stakeholders to address immediate priorities and prepare for future emergencies. As such,

planning funds to support the development of HIT Roadmaps, emergency preparedness, and business process analysis to ensure we achieve smart cities and communities envisioned for the 21st-century solutions. Such solutions must be executed and funded (ARPA, CARE, future federal incentives, etc.) for STLTs to meet key strategic national goals and address specific local gaps.

- **1 State PH Strategist - this position works along with the STLT chief informatics officer or chief data officer to carryout interoperability assessments across the spectrum and operationalizes and implements approved plans** (1/FTE and .25 support Staff) - \$175,000 for each state/territory (7 year period) ~ **\$67 mil**
- **Health IT Assessment/State Health IT Roadmapping** – 150,000/4 year intervals (May include state/STLT match requirement) ~ **\$8.2 mil**
- **Investment creating a national framework, model law, and policy** - to support STLT health systems transformation across the spectrum of care and in light of current and future PHE. Includes recommendations by the [Network for Public Health Law](#) that supports the development of federal and state/territorial unifying model laws and policies, and state/territorial monitoring, analysis, and reporting to HHS/CDC for a single investment of \$1,000,000 x 10 CDC Regions = ~**\$10,000,000**

**Funding Estimate: ~\$85.2 mil**

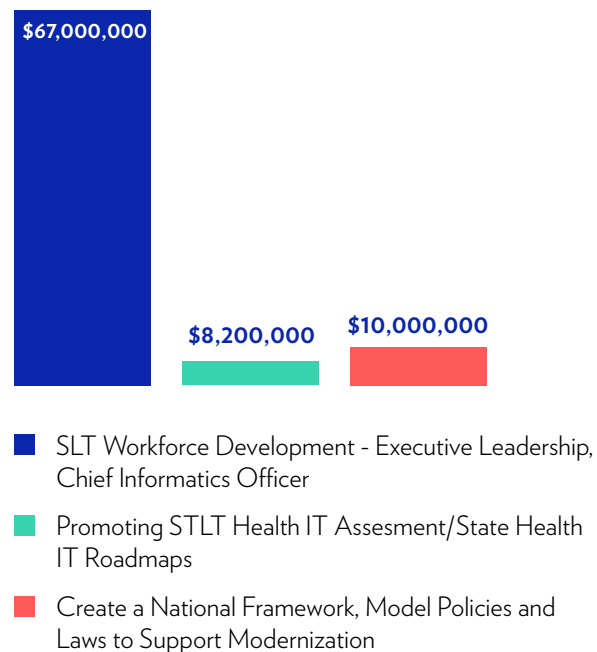
### Build a Foundation of Interoperable Platforms to Facilitate Broad-Based Data Exchange

**Funding Recommendation:** Leverage state, local or regional HIEs – incentivized to support public health bi-directional exchange across public health reporting systems and EHRs, prioritizing critical access hospitals and community health centers. There are model practices such as the Indiana HIE, which sends daily alerts of reportable labs to public health departments, which can be leveraged by healthcare and policy officials. Additional models such as Healthix in NY should be replicated. Such

models support SDOH and ongoing situational awareness, extending the tools of the state/ local epidemiologist and health strategists when reporting more real-time data, including:

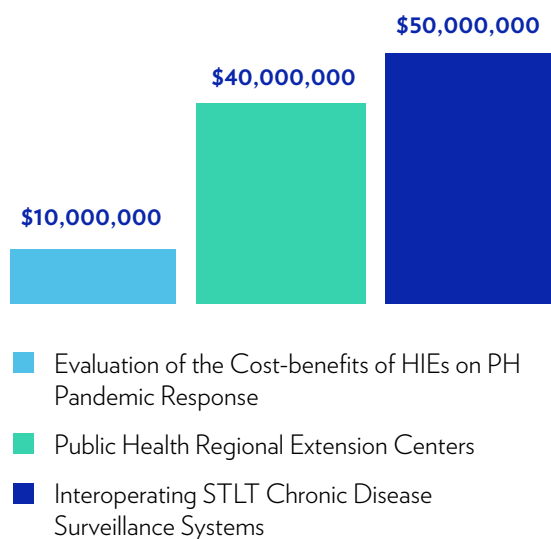
- Demographics
- Encounter type and location
- Lab orders and results (ex. COVID-19 LOINC Codes)
- Diagnoses
- Ventilation
- Discharge disposition
- eCR, eLR, Syndromic surveillance, immunization, and vital stats
- Certified EHRs taken to the next level – through validation - to ensure consistency in eLR messaging and completeness of demographics

**Figure 4. Proposed Investment for a Nimble Rapid Cycle Learning Health System - \$85,200,000**



The strategies above can be broadly implemented by extending and expanding the ONC's HIE program to strengthen and expand the ability of health information exchanges (HIEs) to support public health agencies in their response to public health emergencies and pandemics such as Coronavirus Disease 2019 (COVID-19).

**Figure 5. Proposed Funding for Interoperable Platforms to Facilitate Broad-Based Data Exchange - \$100,000,000**



**Public-Private incentives to drive this solution should include up to \$40 million for functional regional/state HIEs supporting public health agencies over a five-year span.**

- The \$40 million investment includes funding for PH “Regional Extension Centers” to provide the technical support for business process analysis and redesign, cross-sector system mapping, and to support the development of strategic and operational plans supporting implementation and procurement per national interoperability standards, STLT business environments, enterprise DMI priorities, and smart communities-cities investments.
- HHS funding of at least **\$10 million for an academic partner(s) to evaluate the cost-benefits of HIEs on PH response to COVID-19** is also recommended. Evaluation efforts will set a baseline for ROI and highlight state/regional best practices and optimal implementation efforts.
- Funding for **interoperability across the spectrum of care in the amount of \$50 million is needed to ensure chronic disease surveillance systems at the STLT level are linked and accessible** via HIEs, STLT data hubs, and other relevant secure data lakes or care coordination platforms, such as the North Carolina CARES platform. Interoperability across public health, behavioral health, etc. is necessary to develop community-driven health equity solutions and quality improvements.

**Funding Estimate: ~\$100 mil**

**Annual licensing costs, software updates, hardware updates**

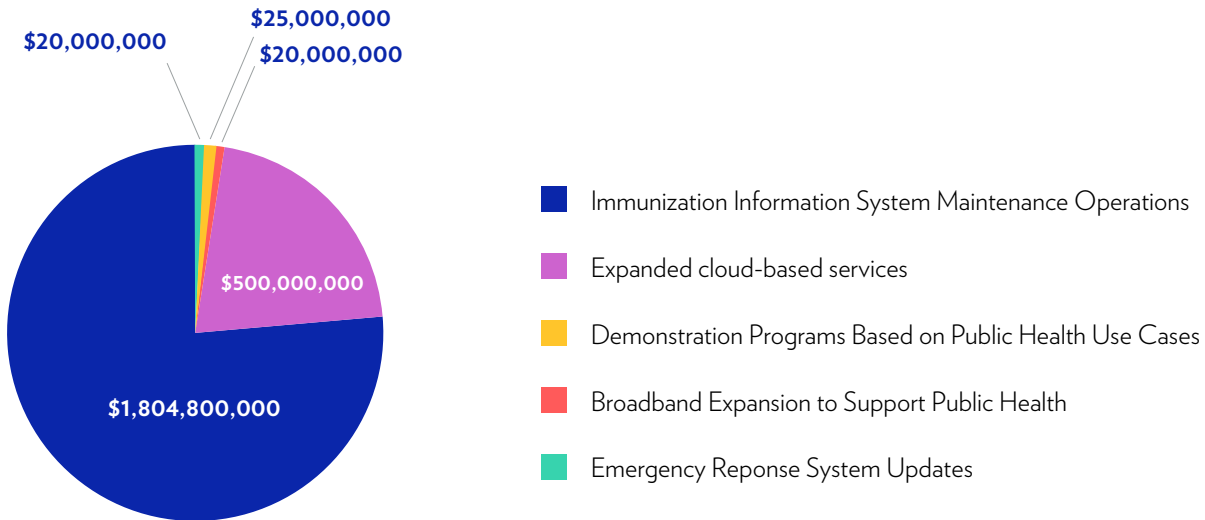
Recent recommendations outlined in the proposed Prevent Pandemics Act, a joint report by the National Network of Public Health Institutes and the Kresge Foundation, and the America Immunization Registry Association, suggest that future PH System Transformation funding should also support:

- **Expanded cloud-based services**, e.g., IIS in the cloud (AWS) = \$500,000,000 investment
- **Immunization Information System maintenance and operations** following initial investment: \$1,050,000 x 64 x 7 years = \$470,400,000
  - a. **Provider Onboarding, Outreach & Training:** \$50,000 x 64 x 7 years = \$22,400,000
  - b. **Minimum Immunization Information System staffing** within thirteen different categories, as validated by the [PHII’s workforce categories](#) and the addition of business analysis, project management, programming and epidemiology : \$175,000 x 10 positions x 64 IIS x 10 years (\$1,120,000,000) + \$100,000 x 3 positions 64 IIS x 10 years (\$192,000,000) = \$1,312,000,000
- **Emergency response systems updates** include enhanced syndromic surveillance that may need expanded geospatial data systems (ArcView GIS). Also requires workforce trainings for E.M./first responder staff based on use cases that involve synchronization with healthcare/public health/HIE data = ~\$20,000,000
- **Demonstration programs based on PH use cases** to fund model practices in quality improvement and broader recognition and acceptance of new business processes in a digital environment across all related HHS programmatic functions = ~ \$25,000,000

- **Broadband expansion to support public health:** – both PH digitization in rural/frontier areas and its use to expand communication and digital access to information by patients/the public in coordination with other federal/state broadband initiatives = ~\$20,000,000

**Funding Estimate: \$2,369,800,000**

**Figure 6. Annual Licensing Costs, Software Updates, Hardware Updates: \$2,369,800,000**



**Grand Total Funding Estimate for Core Investments to Modernize and Interoperate State, Local, And Tribal Public Health Systems: ~\$36,730,775,000**

# APPENDIX

## Baseline Funding Assessment

To calculate a baseline of investments needed to modernize and transform public health systems, HIMSS considered the following five determining factors to arrive at baseline costs for 21st-century public health system transformation and data modernization among governmental health agencies.

- Defining the universe of funding across all HHS systems.
- What is currently being spent?
- What is needed (short-term)?
- What is needed (long-term)?
- What role can HHS/ONC/CDC/CMS/HRSA/ASPR play in an enterprise modernization approach?
- What is needed to determine a common standard of public health data infrastructure?
- What infrastructure already exists (e.g., the role of HIEs, state health IT roadmaps, emergency preparedness plans, etc.)?
- What are the connections with other organizations, e.g., State Medicaid?

There are approximately 3,000 local health departments in the United States (National Association of County & City Health Officials) coupled with 50 state departments of health, eight territories, and the District of Columbia. Through interviews with the Data: Elemental to Health Campaign partners and other key stakeholders at state and local public health agencies, health systems, market suppliers, and interoperability experts, HIMSS has developed estimates for price points on salaries, hardware, software, licensing, training, and additional anticipated costs.

**A = Labor Costs**

**B = System Costs**

**C = 3,050 STLTs Departments**

### **Electronic case reporting: \$52,500,000**

- $A (6 \text{ FTEs} \times \$175,000 = \$1,050,000) + B (0) \times 50$  (state level)

### **Disease Surveillance: \$393,750,000**

- Disease Surveillance system purchase:  $A (0) + \$5,000,000 \times 50 = \$250,000,000$
- Disease surveillance system maintenance:  $\$2,000,000 \times 50 = \$100,000,000$
- Disease surveillance system staffing:  $(A) \$875,000 \times 50 = \$43,750,000$

### **Laboratory information management system (LIMS): \$162,500,000**

- Laboratory Information Management System purchase  $\$1,000,000 \times 50 = \$50,000,000$
- Electronic test ordering and reporting (ETOR)  $\$1,000,000 \times 50 = \$50,000,000$
- Electronic lab reporting – staff  $(7 \text{ FTEs} \times 175,000 = 1,225,000) \times 50 = \$62,500,000$

### **Vital Records: \$305,025,000**

- Vital Records purchasing  $\$5,000,000 \times 50 = \$250,000,000$
- Vital records maintenance  $\$100,000 \times 50 = \$5,000,000$
- Vital records staffing  $\$1,005,000 \times 50 = \$50,025,000$



**Disease/syndromic surveillance systems \$700,000 x 50 = \$250,000,000**

**Immunization Information System (IIS): \$507,200,000**

- Immunization Information System (IIS) purchase: \$3,000,000 x 64 IIS = \$192,000,000.
- Provider onboarding, outreach, training: \$1,750,000 x 64 IIS = \$112,000,000
- Staffing to support additional needs during the IIS build and deployment phases: \$134,400,000 + est. Four positions (Trainer, Project Manager, Business Analyst, Programmer) at \$175,000 x 64 awardees x 3 years + \$33,600,000
- Immunization Information System Data maintenance and Migration from legacy systems to new platforms: \$900,000 x 64 IIS = \$57,600,000
- Provider onboarding, outreach, training: \$1,750,000 x 64 IIS = \$112,000,000

**State, Territories, Local and Tribal (STLT) Level Transformation = \$1.646975 billion**

**Local functionality theory formula:**

- Staffing cost estimate \$50,000 x role (lab reporting, DS, CR = 3) x 2 people x 3000 sites x 5 years = \$4,500,000,00
- Hardware, maintenance, and licensing \$14,800,000 x .50 (local level) x 3000 = \$22,200,000,000

**Support state funding for:**

- State level total \$1,363,775,000
- Local staffing \$1,800,000,000
- Local HW/SW/M/L \$22,200,000

**TOTAL ~. \$33,315,175,000**

**Please contact HIMSS at [policy@himss.org](mailto:policy@himss.org) with questions or recommendations.**

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