Altarum

APRIL 2025

Artificial Intelligence and Machine Learning for Public Health Data Modernization: An Explainer

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Executive Summary

Public health systems across the country are undergoing data modernization, and artificial intelligence (AI) and machine learning (ML) will play a significant role in this effort.

AI refers to computer systems that can perform tasks that typically require human intelligence. ML is a subset of AI in which systems learn from data without explicit programming.

AI and ML offer transformative capabilities for public health, enhancing functions such as disease surveillance, data quality management, resource optimization, and workflow automation.

Altarum has identified five key AI/ML-enhanced use cases for advancing public health data modernization:

1. Public health decision support platform
2. Community health intelligence suite
3. Public health workforce augmentation through AI
4. AI-enhanced emergency response coordination
5. Predictive population health management

These cases can best be supported by what are called “multi-agent frameworks.” In such frameworks, multiple specialized AI agents work together to solve complex problems, mirroring the ways public health teams function. This paper also includes an overview of what is required for implementation and a recommended timeline. Successful implementation of AI/ML in public health requires more than just technological implementation. It demands organizational readiness, sustained commitment from leadership, investment in workforce development, and a culture that embraces innovation while maintaining a strong ethical foundation.

Altarum is excited by the transformational opportunities of AI in public health and looks forward to supporting public health agencies with implementation.

For more information, please contact Jim St. Clair, Vice President, Public Health Systems at jim.stclair@altarum.org

Introduction

Public health agencies (PHAs) across the United States are undergoing a significant transformation in how they collect, analyze, and utilize data. The COVID-19 pandemic highlighted both the critical importance and current limitations of our public health data infrastructure. In response, the Centers for Disease Control and Prevention (CDC) has allocated $4.8 billion through the Public Health Infrastructure Grant (PHIG) program to rebuild and modernize public health systems.

For more than 30 years, Altarum has helped public health agencies across the United States advance their information infrastructure, supporting numerous states as part of PHIG implementation, modernizing electronic case reporting (eCR), and improving data analytics and visualization.

The last two years represent nothing less than a revolution in the development and adoption of artificial intelligence (AI) and machine learning (ML), and new use cases, applications and technology providers are offering new solutions to augment and automate workflows, analyze data, and provide predictive analytics. AI/ML provides tremendous opportunity to streamline reporting processes and add additional value to population health information.

The entire Altarum enterprise, including Population Health, Public Health Systems, Palladian Partners, and Altarum Medicare Medicaid Services for States (AMMS), is embracing the AI/ML revolution and will lead its adoption to advance our public health mission.

To better inform the public health community, Altarum is offering this guide to provide an informative overview of how AI/ML can enhance public health data modernization efforts. We created it for public health professionals who may not have extensive technical knowledge of AI/ML or cloud computing services but understand the core functions and challenges of public health work.

For more information, please contact Jim St. Clair, Vice President, Public Health Systems at jim.stclair@altarum.org

Understanding the Current Landscape

Since the pandemic, we've been assisting public health agencies across the country with several initiatives designed to help PHAs modernize their information infrastructure and improve data sharing. These lay the groundwork for adopting cloud computing and AI/ML, as we'll discuss further.

Public Health Infrastructure Grant (PHIG) Program

In 2024, CDC allocated $4.8 billion for the Public Health Infrastructure Grant (PHIG) program to launch the new Implementation Center Program to support public health agencies as they modernize their data systems. The program has three pillars:

1. Workforce Development ($3 billion): Hiring, training, and retaining public health staff
2. Data Modernization ($811 million): Upgrading technology, training, and staffing for improved disease detection and response
3. Foundational Capabilities ($630 million): Building skills and services for disease surveillance, partnerships, readiness, and communications

Within this framework, the PHIG Implementation Centers program provides $361 million for training, technical assistance, evaluation, and communication support to public health agencies.

Altarum, with our collaboration partner Mathematica, is assisting PHAs in these modernization efforts.

Electronic Case Reporting (eCR)

Electronic case reporting is an automated process enabling secure health information exchange between healthcare providers and public health agencies. The purpose is to streamline infectious disease reporting through real-time data sharing, allowing PHAs to quickly respond to outbreaks and monitor trends.

How eCR Works

1. A patient is diagnosed with a reportable condition.
2. A provider enters information into the EHR system
3. Data automatically triggers a case report, which is validated and sent to appropriate PHAs.
4. The PHA receives the report in real-time and can take necessary action.

While eCRs have represented a significant improvement over "flat files" and spreadsheets to collect information, other systems and services are necessary for analysis, data synthesis, and dissemination of useful public health information.

Trusted Exchange Framework and Common Agreement (TEFCA)

As part of the 21st Century Cures Act, TEFCA establishes a common set of principles, terms, and conditions for nationwide exchange of electronic health information across different Qualified Health Information Networks (QHINs). This framework enables standardized, secure data sharing between healthcare organizations, public health agencies, and other stakeholders. TEFCA provides new frameworks for agencies to both collect and share information, giving agencies greater pools of knowledge and offering new channels for dissemination. As part of our data modernization, Altarum is assisting with the integration of public health data exchange with QHINs in different geographic areas.

For more information, please contact Jim St. Clair, Vice President, Public Health Systems at jim.stclair@altarum.org

AI/ML Applications in Public Health

The combination of the new developments in data modernization with the new advances in industry has begun to show how AI/ML offers transformative capabilities for public health. AI refers to computer systems that can perform tasks that typically require human intelligence. ML is a subset of AI where systems learn from data to improve performance without explicit programming.

How AI/ML Can Enhance Public Health Functions
More than just improving reporting or assisting with traditional data collection, AI/ML can radically improve agency tasks and provide greater predictive abilities and more actionable information. Notable examples include:

Disease Surveillance and Prediction

- Early detection of outbreaks through pattern recognition
- Forecasting disease spread based on multiple data sources
- Identifying unusual clusters that might indicate emerging threats

Data Quality Management

- Automated validation of health reports
- Detection of inconsistencies, gaps, and anomalies
- Standardization of data from disparate sources

Resource Optimization

- Predicting resource needs during outbreaks
- Optimizing staff allocation based on disease burden
- Determining the most effective intervention strategies

Analysis of Factors Determining Health

- Identifying and mapping variations in health outcomes across populations
- Optimizing interventions

Workflow Automation

- Streamlining routine administrative tasks
- Generating reports and summaries automatically
- Providing decision support at critical junctures

Outreach Campaign Enhancement

- Launching campaigns faster with comprehensive AI-populated plan templates
- Training generative AI tools to speak to target populations more meaningfully
- Generating first drafts of content and creative assets based on key messages
- Streamlining and automating logistics for engagement events

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Six Key AI/ML Use Cases

Altarum has identified five AI/ML-enhanced use cases that leverage the comprehensive approach to advancing public health data modernization, and assist PHAs with recognizing new capabilities:

1. Public Health Decision Support Platform

An AI-powered analytics platform providing evidence-based insights for public health decision-making.

Core Capabilities

- Predictive modeling for disease surveillance
- Resource allocation optimization
- Scenario analysis for intervention planning
- Impact assessment of public health measures
- Integration with existing surveillance systems

Benefits to PHAs

- Move from reactive to proactive disease management
- Optimize limited resource allocation
- Provide evidence for policy decisions
- Enhance cross-jurisdictional coordination

2. Community Health Intelligence Suite

An AI system dedicated to identifying and addressing gaps in health access to healthcare.

Core Capabilities

- Social vulnerability mapping and analysis
- Community resource and gap identification
- Impact assessment
- Targeted intervention planning
- Community engagement tools

Benefits to PHAs

- Data-driven approach to community health
- Optimal targeting of limited resources
- Enhanced community partnership opportunities
- Ability to measure improvements in community health

3. Public Health Workforce

Augmentation through AI tools designed to multiply the effectiveness of the public health workforce, especially valuable for under-resourced departments.

Core Capabilities

- Natural language interfaces for data querying
- Automated report generation and summarization
- AI-assisted investigation and case management

- Knowledge retrieval and decision support
- Workflow automation for routine tasks

Benefits to PHAs

- Extend capabilities of limited workforce
- Reduce time spent on administrative tasks
- Improve consistency in processes
- Enhance knowledge transfer and institutional memory

4. AI-Enhanced Emergency Response Coordination

In addition to typical public health service, PHAs play a vital role in supporting emergency response. A platform for coordinating multi-agency emergency response with AI-optimized resource allocation and communication can be a "force multiplier" in deploying services and information for disaster response.

Core Capabilities

- Real-time situational awareness
- Resource matching and allocation algorithms
- Multi-agency coordination tools
- Automated stakeholder communication
- Scenario modeling for response planning

Benefits to PHAs

- Faster, more coordinated emergency response
- Optimal resource deployment during crises
- Improved information sharing across agencies
- Data-driven decision-making under pressure

5. Predictive Population Health Management

State departments of health, in their other vital role of supporting their Medicaid programs, are working harder than ever to identify opportunities to improve population health and optimize value-based care. An AI system for identifying at-risk populations and predicting emerging health needs to enable proactive interventions can help lower costs and achieve better health outcomes.

Core Capabilities

- Population risk stratification
- Early intervention recommendation engines
- Personalized care pathway optimization
- Outcome prediction models
- Integration with clinical and public health data

Benefits to PHAs

- Shift from reactive to proactive approaches
- Better targeting of preventive interventions
- Improved population health outcomes
- Enhanced collaboration with healthcare providers

6. Strategic Communications Intelligence Engine

The communication of public health information plays an important role in a healthy population. An AI-driven platform designed to optimize public health messaging, media engagement, and behavioral influence strategies through real-time audience insights and automated content adaptation.

Core Capabilities

- Sentiment and narrative trend analysis across digital and traditional media
- AI-powered audience segmentation and persona modeling
- Message testing and optimization using predictive engagement models
- Automated generation of tailored communication assets
- Detection and countering of misinformation/disinformation

Benefits to PHAs

- Deliver more relevant, resonant messaging to diverse audiences
- Rapidly adapt communications during emerging crises or evolving narratives
- Increase reach and effectiveness of health campaigns with fewer resources
- Improve trust and credibility through precision-targeted outreach
- Strengthen resilience against harmful misinformation and public confusion

Summary: Join the AI Revolution

New technologies and initiatives are already modernizing public health operations. The CDC's Public Health Infrastructure Grant program supports workforce development, data upgrades, and fundamental public health capabilities. Digital automation supports real-time disease data sharing and nationwide data exchange.

AI/ML promises even greater transformation. These tools help PHAs improve everything from disease surveillance and data quality to workflow automation. AI/ML empowers agencies to shift from reactive measures to actionable strategies, addressing challenges swiftly and effectively.

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Multi-Agent Frameworks for Enhanced Capabilities

Introducing the AI "Agent"

AI agents are smart computer programs that can work on their own to complete tasks. They can understand what's happening around them, make choices, and take action without needing people to guide them every step of the way. These agents handle such tasks as answering questions, controlling smart home devices, or helping doctors analyze health information.

As AI agents improve, they're changing how we interact with computers. Today's agents are good at specific jobs they're trained for, but scientists are working to create agents that can handle many kinds of tasks. These more sophisticated agents can use what they learn in one situation to solve problems in another situation, understand why things happen, and think more like humans do. This could help them deal with the complicated situations we face in public health.

Since becoming popular in early 2024, AI agents have become much smarter and more helpful. They started out being able to do simple jobs like answering questions or looking at data, but now they can understand pictures, sounds, and videos along with text. This helps them better understand what people are asking for. These new AI agents are also better at breaking big problems into smaller steps, and they can remember prior conversations.

AI agents can now work together as a team to solve hard problems, with each one doing what it's best at. They can also use other computer tools like search engines or calculators to help them find answers. When AI agents work together, it's called a multi-agent (or "agentic") framework.

What Is a Multi-Agent Framework?

A multi-agent framework leverages multiple specialized AI agents working together to solve complex problems. It can reflect the way public health agencies function, with specialists in different areas collaborating toward common goals. These agents can:

- Work autonomously within their domains
- Communicate with each other to share information
- Coordinate activities toward common goals
- Adapt behavior based on feedback and outcomes

Multi-Agent Applications in Public Health

Building upon the examples given previously, we can highlight how agents can work together more independently and provide multiple, guided assistants to improve agency efforts.

1. Public Health Decision Support Platform

- Data Integration Agents: Specialized for different data sources (EHR, surveillance, registry data)
- Domain-Specific Analysis: Epidemiological modeling, resource allocation, intervention planning
- Scenario Simulation: Representing different stakeholders to predict policy outcomes

2. Community Health Intelligence Suite

- Community Resource Agents: Represent different resource types (housing, food, healthcare)
- Stakeholder Perspective: Evaluate initiatives from different viewpoints (residents, providers, policymakers)

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- **Outreach Coordination:** Specialize in different communication channels and communities

3. Public Health Workforce Augmentation

- **Specialized Knowledge Agents:** Insights into disciplines such as epidemiology, environmental health, and healthcare administration
- **Workflow Assistant:** Document preparation, investigation guidance, data analysis, project management
- **Training and Development:** Personalized learning, simulation creation, skill assessment

4. AI-Enhanced Emergency Response

- **Emergency Role Agents:** Reflecting Incident Command System roles with specialized responsibilities
- **Resource Management:** Transportation, medical resources, personnel, supply chain
- **Situation Assessment:** Geographic zones, threat types, infrastructure systems, public information

5. Predictive Population Health Management

- **Patient Journey Agents:** Risk assessment, care coordination, intervention recommendation
- **Clinical Specialty:** For different health conditions, medication management, preventive care
- **Health System:** Provider organizations, payers, community services, policy alignment

Benefits of Multi-Agent Frameworks

In each of the five use cases highlighted, multi-agent frameworks provide unique technical capabilities to improve efficiency, support staff specialists, and reduce burden on limited staff by delivering:

- **Specialized Expertise:** Each agent can excel in a specific domain, such as public health professionals
- **Complex Problem Solving:** Collaborative approach to multi-faceted challenges means more answers and timely decisions
- **Adaptability:** System can evolve by adding or modifying agents as needs change
- **Robustness:** System continues functioning even if individual agents fail – agents learn to "pick up the slack."
- **Emergent Insights:** Interactions between agents can reveal patterns or solutions not obvious to any single agent, especially in frameworks across multiple systems.

The Power of Multi-Agents Frameworks

AI agents are autonomous programs capable of understanding environments, making decisions, and taking actions independently. Multi-agent frameworks take this further by enabling AI agents to collaborate, much like human teams, to address complex challenges. These frameworks hold particular promise for public health. By collaborating seamlessly, adapting swiftly, and supporting each other effectively, these frameworks enable PHAs to tackle complex challenges with greater efficiency and resilience.

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Information Architecture Development

Developing the information architecture for AI/ML applications requires a systematic approach. For public health professionals, this means considering the way data flows and how it becomes actionable intelligence.

Altarum recognizes that information architecture provides the essential foundation for AI innovation. Our expertise includes comprehensive data flow analysis, mapping the way information moves throughout your organization; robust data governance frameworks that ensure quality and compliance; thorough security assessments that protect valuable assets; and strategic implementation of new tools and technologies.

Our technical infrastructure expertise allows us to create a digital ecosystem in which AI/ML solutions can access clean, organized data through secure pipelines. Our governance structures provide the ethical guardrails and quality controls that enable responsible agentic workflows to deliver transformative outcomes without compromising security or compliance.

Common Architecture Components

Each AI/ML service offering includes these key architectural layers:

1. Data Layer
    - Core data sets from multiple sources
    - Data storage appropriate to the use case
    - Data processing pipelines and quality management
2. Analytics Layer
    - Machine learning models for specific functions
    - Analytics processing engines
    - Knowledge management systems
3. Application Layer
    - User interfaces and visualizations
    - Integration services with existing systems
    - Workflow components
4. Security Layer
    - Access controls and authentication
    - Privacy protection mechanisms
    - Audit and compliance monitoring

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Development Process for Each Offering

Altarum has refined our data modernization strategy to prepare agencies for AI adoption, leveraging the five offerings as a step-by-step development process, although with specific activities tailored to a client's unique requirements.

We offer a roadmap to guide agencies through the development process and effectively deploy new AI/ML solutions:

Step 1: Data and Requirements Assessment (Weeks 1-4)

- Inventory available data sources
- Assess data quality and accessibility
- Define standardization needs
- Document user requirements and workflows

Step 2: Data Architecture Design (Weeks 5-8)

- Design appropriate data storage strategies
- Create data models and schemas
- Define data flows and integration patterns
- Establish data governance frameworks

Step 3: Analytics Framework Development (Weeks 9-12)

- Define analytical approaches and models
- Design feature engineering processes
- Create model management frameworks
- Develop knowledge systems

Step 4: Application Design (Weeks 13-16)

- Design user interfaces and dashboards
- Develop API and integration architecture
- "Screen scrape" legacy workflows or create workflow components
- Define user journeys and experiences

Step 5: Governance Implementation (Weeks 17-20)

- Implement security controls
- Establish data governance processes
- Ensure compliance with regulations
- Develop ethical AI frameworks

Cross-Cutting Implementation Activities

Elements of our implementation process align with other modernization efforts and workforce improvements, aiding the capability of the agencies in addition to modernizing technology:

1. Data Governance Implementation

   - Establish governance councils
   - Implement metadata management
   - Define data quality frameworks
   - Create access management systems

2. Security and Privacy Framework

- Implement security controls
- Create privacy protection mechanisms
- Develop compliance documentation
- Establish incident response procedures

3. Technical Foundation Building

- Set up cloud infrastructure
- Implement DevOps pipelines
- Create MLOps frameworks
- Design API management

4. Talent and Team Development

- Build data engineering capabilities
- Develop data science expertise
- Create product development teams
- Enhance domain knowledge

Implementation Roadmap

Implementing AI/ML capabilities for public health requires a phased approach to ensure successful adoption and sustainable outcomes.

Foundation Building (0-6 months)

1. Capability Assessment

- Evaluate existing technical capabilities
- Identify skill gaps and training needs
- Assess data availability and quality
- Determine build vs. buy decisions

2. Needs Validation

- Conduct stakeholder interviews
- Define high-value use cases
- Prioritize initiatives based on impact and feasibility
- Create concept prototypes for feedback

3. Strategic Partnerships

- Identify technology partners
- Explore academic collaborations
- Establish relationships with domain experts
- Define partnership governance

4. Ethics and Governance Framework

- Develop AI ethics guidelines
- Create transparency protocols
- Establish bias monitoring processes
- Define oversight responsibilities

Initial Development (6-12 months)

1. Pilot Implementation

   - Select initial implementation sites
   - Focus on high-value, lower-complexity use cases
   - Develop metrics for measuring impact
   - Establish feedback mechanisms

2. Platform Development

   - Build core infrastructure components
   - Develop integration capabilities
   - Create scalable architecture
   - Implement security and privacy controls

3. Talent Development

   - Recruit specialized expertise
   - Train existing staff
   - Establish centers of excellence
   - Create knowledge sharing mechanisms

4. Positioning and Communication

   - Develop messaging and value propositions
   - Create case studies and success stories
   - Engage with stakeholder communities
   - Build awareness through targeted outreach

Expansion and Scaling (12-24 months)

1. Solution Packaging

   - Standardize successful pilots
   - Create implementation playbooks
   - Develop support materials and training
   - Define pricing and sustainability models

2. Deployment Scaling

   - Expand to additional sites
   - Develop streamlined onboarding
   - Create user community platforms
   - Establish support mechanisms

3. **Capability Enhancement**

   - Add advanced features based on feedback
   - Expand data sources and integrations
   - Implement cross-system capabilities
   - Develop advanced analytical models

4. **Continuous Innovation**

   - Establish innovation processes
   - Create feedback-driven improvement cycles
   - Develop emerging technology pilots
   - Build research partnerships

Technology Infrastructure and Tools

Modern AI/ML applications in public health leverage cloud computing services that provide scalable, secure, and specialized capabilities. Altarum leverages our technology partnerships, such as Amazon Web Services (AWS), Rhapsody, and others to effectively deliver these capabilities.

Core Technology Components

Effectively leveraging AI/ML in public health requires a well-defined technological framework. Here are essential components that support data management, AI/ML processing, system integration, and user interaction.

Data Storage and Management

- Data lakes for raw, unstructured data
- Data warehouses for structured analytical data
- Specialized databases for specific use cases (time-series, graph, spatial)
- Master data management for entity resolution

AI/ML Processing

- Foundation models for natural language understanding
- Machine learning platforms for model development
- Specialized healthcare AI services
- Model monitoring and management systems

Integration and Connectivity

- API management platforms
- Health data standards support (FHIR, HL7)
- Event processing systems
- Secure connectivity services

User Interface and Visualization

- Interactive dashboard platforms
- Geospatial visualization tools
- Mobile application frameworks
- Natural language interfaces

Cloud Services for Public Health AI/ML

Cloud computing provides the foundation for modern AI/ML applications, and it includes services specifically designed for healthcare and public health use cases.

Data Foundation Services

- **Health data repositories:** Specialized services for managing healthcare data in standard formats
- **Data integration tools:** Services for extracting, transforming, and loading data from multiple sources
- **Large-scale storage:** Cost-effective storage for vast amounts of public health data

AI and Analytics Services

- **Foundation model access:** Services providing access to large language models and other AI capabilities
- **Healthcare-specific AI:** Tools designed specifically for healthcare text analysis and insights

- **Machine learning platforms:** Services for building, training, and deploying custom ML models

Security and Compliance Services

- **HIPAA-compliant infrastructure:** Services designed to meet healthcare privacy requirements
- **Identity and access management:** Tools for controlling who can access sensitive health data
- **Encryption and protection:** Services for securing data at rest and in transit

Application Services

- **Visualization tools:** Services for creating interactive dashboards and reports
- **API management:** Tools for creating and managing secure interfaces between systems
- **Serverless computing:** Services that scale automatically based on demand

Multi-Agent System Implementation

Implementing multi-agent frameworks requires specialized services, including:

- **Agent Orchestration:** Services for coordinating multiple AI agents
- **Event Communication:** Tools for enabling inter-agent messaging
- **State Management:** Services for tracking agent status and context
- **Agent Monitoring:** Tools for observing agent performance and behavior

Critical Success Factors

Successfully implementing AI/ML in public health requires attention to several critical factors.

Organizational Alignment

Executive Sponsorship

- Securing leadership commitment to AI/ML initiatives
- Aligning AI/ML strategy with organizational priorities
- Ensuring sustained support through implementation challenges

Resource Allocation

- Dedicating appropriate funding for technology and talent
- Allocating staff time for implementation and adoption
- Planning for sustainable operational funding

Change Management

- Preparing the organization for new ways of working
- Addressing concerns about AI/ML adoption
- Creating champions at all levels of the organization

Technical Excellence

Data Quality Foundation

- Ensuring data accuracy, completeness, and timeliness
- Establishing data governance processes
- Creating data quality monitoring and improvement cycles

AI/ML Expertise

- Building or acquiring specialized technical skills
- Creating interdisciplinary teams with domain and technical knowledge

- Establishing continuous learning opportunities

Integration Capabilities

- Ensuring seamless connections with existing systems
- Minimizing disruption to current workflows
- Creating unified user experiences across capabilities

Value Demonstration

Outcome Measurement

- Defining clear metrics for success
- Establishing baselines before implementation
- Creating dashboards to track progress and outcomes

Return on Investment

- Quantifying benefits in terms meaningful to stakeholders
- Capturing both tangible and intangible returns
- Demonstrating value through case studies and examples

User Satisfaction

- Gathering feedback throughout the implementation
- Making adjustments based on user experience
- Celebrating and sharing success stories

Ethical Implementation

Fairness

- Ensuring AI/ML systems do not perpetuate or amplify biases
- Testing across populations and scenarios
- Creating mechanisms to identify and address unfairness

Transparency

- Making AI/ML decision processes understandable
- Providing appropriate explanations for recommendations
- Being clear about limitations and uncertainties

Privacy Protection

- Implementing robust data protection measures
- Ensuring appropriate consent and data use
- Creating governance for sensitive information

AI/ML Changes Everything: Let Altarum Prepare You for the Future of Public Health

Artificial intelligence and machine learning are poised to redefine the future of public health, offering unprecedented opportunities to transform how we address complex health challenges.

At Altarum, we lead the way in harnessing these technologies to drive meaningful, measurable improvements in public health outcomes. With deep expertise in data modernization and AI implementation, we empower public health agencies to unlock the full potential of their data, enabling smarter decision-making and more impactful interventions. Our collaborative approach ensures that each AI/ML solution we develop is tailored to the unique needs of public health, driving sustainable advancements in the health of the communities they serve.

We invite technology providers, academic institutions, funders, and public health organizations to partner with us in this transformative journey. Together, we can:

- Design and implement innovative AI/ML solutions that address the most pressing public health challenges.
- Strengthen agency capabilities with scalable, data-driven strategies.
- Accelerate progress through collaborative research and thought leadership.

At Altarum, we don't just adopt technology – we guide others in adopting it effectively, ensuring maximum value for every investment in AI and data modernization. Join us as we shape the future of public health through innovation, expertise, and a shared commitment to healthier communities.

Take the first step towards shaping the future of public health. Contact our Growth Team at growth@altarum.org to explore collaboration opportunities.

For more information, please contact Jim St. Clair, Vice President, Public Health Systems at jim.stclair@altarum.org

Knowledge Check

Test your understanding of AI/ML in public health with these questions:

1. Understanding the Basics
    - What are the three fundamental pillars of the Public Health Infrastructure Grant (PHIG) program?
    - How does Electronic Case Reporting (eCR) differ from traditional case reporting?
    - What is the purpose of the Trusted Exchange Framework and Common Agreement (TEFCA)?
2. AI/ML Applications
    - Name three ways AI/ML can enhance disease surveillance capabilities.
    - How can AI/ML assist with addressing health equity challenges?
    - What workforce challenges can AI/ML help address in public health agencies?
3. Service Offerings
    - Which AI/ML offering would be most appropriate for optimizing emergency response during a disease outbreak?
    - How does the Community Health Intelligence Suite differ from traditional GIS mapping tools?
    - What specific benefits would a rural health department with limited staff gain from the public health workforce augmentation tools?
4. Multi-Agent Frameworks
    - What is a multi-agent framework and how does it differ from a single AI system?
    - How might different agents collaborate in a disease outbreak scenario?
    - What advantages does a multi-agent approach offer for addressing complex public health problems?
5. Implementation Considerations
    - What key stakeholders should be involved in planning an AI/ML implementation?
    - What data governance considerations are most important when implementing AI/ML in public health?
    - How would you measure the success of an AI/ML implementation in a public health agency?

Glossary of Terms

Artificial Intelligence (AI): Computer systems capable of performing tasks that typically require human intelligence.

DevOps: Set of practices combining software development and IT operations to shorten development cycles and provide continuous delivery.

Electronic Case Reporting (eCR): Automated process for secure exchange of health information between healthcare providers and public health agencies.

FHIR: Fast Healthcare Interoperability Resources, a standard for exchanging healthcare information electronically.

Foundation Models: Large AI models trained on vast amounts of data that can be applied to multiple tasks.

Health Information Exchange (HIE): The electronic movement of health-related information among organizations.

Implementation Centers (ICs): Organizations providing technical assistance to public health agencies for data modernization.

Machine Learning (ML): A subset of AI where systems learn from data to improve performance without explicit programming.

MLOps: Practices for managing the lifecycle of machine learning models from development to deployment and monitoring.

Multi-Agent Framework: System of multiple specialized AI components that collaborate to solve complex problems.

Public Health Infrastructure Grant (PHIG): CDC program providing $4.8 billion for rebuilding public health capabilities.

QHIN: Qualified Health Information Network, an entity that facilitates health information exchange under TEFCA.

Retrieval Augmented Generation (RAG): Technique combining information retrieval with AI text generation for more accurate and informed responses.

Social Determinants of Health (SDOH): Non-medical factors that influence health outcomes, such as housing, education, and economic stability.

TEFCA: Trusted Exchange Framework and Common Agreement, establishing principles for nationwide health information exchange.

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