

Empowering Public Health Surveillance and Response Through Epic on Azure

Dileep Kumar Kanimetta

Independent Researcher, USA

Abstract: The convergence of electronic health records systems and cloud computing infrastructure represents a transformative paradigm shift in public health surveillance and emergency response capabilities. Cloud-hosted EHR platforms enable public health agencies to transition from reactive surveillance models to proactive monitoring systems that provide real-time population health intelligence and predictive analytics capabilities. Modern cloud architecture leverages enterprise-grade infrastructure with global networks of distributed data centers, ensuring high availability, disaster recovery capabilities, and comprehensive compliance with healthcare regulatory requirements, including HIPAA, HITECH, and FedRAMP standards. The platform's microservices architecture enables dynamic resource allocation and horizontal scaling capabilities that accommodate dramatic workload increases during surge events without requiring substantial capital investments or extended deployment timelines. FHIR-based interoperability standards facilitate seamless bidirectional data exchange between public health registries, vaccination systems, laboratory information systems, and local health departments, eliminating traditional data silos through automated mapping of clinical terminology codes. Real-time analytics engines process substantial healthcare data volumes to identify emerging health threats through sophisticated algorithms that detect anomalous patterns rapidly after data availability. Implementation case studies demonstrate the platform's effectiveness during COVID-19 responses, mass immunization campaigns, and environmental health monitoring initiatives, showcasing enhanced operational efficiency, improved data quality, and reduced operational costs. The technological transformation enables comprehensive integration between clinical care delivery and population health management systems, supporting evidence-based policy development and targeted interventions across diverse health domains.

Keywords: cloud computing, electronic health records, public health surveillance, FHIR interoperability, predictive analytics.

INTRODUCTION

In the contemporary landscape of public health, the convergence of electronic health records (EHR) systems and cloud computing represents a paradigm shift in how health agencies monitor, analyze, and respond to population health threats. The global healthcare digitization movement has accelerated the adoption of integrated EHR solutions, with market research indicating substantial growth trajectories driven by regulatory requirements and technological advancements (We Market Research. 2025). This transformation has positioned cloud-based EHR platforms as essential infrastructure for modern public health surveillance and emergency response capabilities.

The integration of enterprise healthcare software with cloud infrastructure has emerged as a transformative solution that fundamentally alters how public health agencies approach population health management. This technical review examines how cloud-hosted EHR systems enable more timely, scalable, and accurate responses to emerging health threats, encompassing pandemic preparedness, environmental health crises, and chronic disease surveillance initiatives. Healthcare organizations implementing cloud-based solutions consistently demonstrate enhanced operational efficiency compared to traditional on-premises deployments, particularly in data processing capabilities and system reliability metrics.

Recent global health events have underscored the critical importance of real-time population health data capture and analysis, revealing significant inadequacies in traditional public health reporting systems. Manual reporting mechanisms proved insufficient for meeting the demands of rapid case identification, contact tracing, and resource allocation during health emergencies. The pandemic response highlighted the stark contrast between automated cloud-based systems and legacy infrastructure, with significant variations in response times and processing capabilities across different implementation approaches.

Modern cloud-hosted EHR platforms address these systemic challenges by providing comprehensive integration between clinical care delivery and population health management systems. The architecture enables seamless transformation of routine healthcare data into actionable public health intelligence, supporting real-time surveillance and predictive analytics capabilities. Cloud infrastructure provides inherent scalability advantages, allowing public health agencies to rapidly expand processing capacity during surge events without requiring substantial capital investments or extended deployment timelines (NetApp).

The operational advantages of cloud-based implementations extend beyond technical capabilities to encompass improved data

integration workflows, enhanced reporting accuracy, and reduced total cost of ownership. These improvements translate directly into measurable public health outcomes, including accelerated disease cluster identification, improved vaccination tracking systems, and reduced redundancies in testing and administrative procedures. The convergence of cloud computing and healthcare informatics represents a fundamental shift from reactive public health responses to proactive surveillance and intervention strategies.

TECHNICAL ARCHITECTURE AND CLOUD INFRASTRUCTURE

Azure Cloud Foundation

The deployment of cloud-hosted EHR systems leverages enterprise-grade infrastructure to create robust foundations for public health operations. Modern cloud architecture utilizes global networks of distributed data centers, providing high availability and disaster recovery capabilities that exceed traditional on-premises solutions. The infrastructure maintains comprehensive compliance with healthcare regulatory requirements, including HIPAA, HITECH, and FedRAMP standards through automated monitoring and continuous assessment protocols (ClearDATA 2025).

Cloud infrastructure provides multi-layered security frameworks that incorporate dedicated cybersecurity expertise and substantial annual investments in protective measures. Healthcare organizations utilizing cloud infrastructure report significantly fewer security incidents compared to traditional deployments, with improved resolution times for critical security events. The foundation architecture supports extensive horizontal scaling capabilities that accommodate dramatic workload increases within minutes, contrasting sharply with traditional infrastructure, which requires weeks for comparable expansion.

Scalable Infrastructure Design

Cloud-native EHR architectures represent fundamental departures from traditional on-premises deployments, utilizing microservices design principles that enable dynamic resource allocation across distributed computing environments. The platform's modular architecture consists of numerous independent service components, each capable of scaling independently based on real-time demand patterns. This granular scalability allows public health agencies to optimize resource utilization while

achieving substantial cost savings compared to traditional monolithic systems.

Dynamic resource allocation enables public health agencies to scale computing capabilities based on fluctuating demands, with automated provisioning systems that deploy additional capacity rapidly during surge events. Mass immunization campaigns and disease outbreak responses demonstrate the system's ability to process dramatically increased data volumes compared to traditional systems managing substantially lower throughput rates. This scalability proves particularly critical during emergency scenarios where traditional infrastructure would require significant capital investments and extended deployment timelines.

Performance characteristics indicate that cloud-hosted systems handle extensive concurrent user loads while maintaining optimal response times for database queries. Load balancing algorithms distribute processing across multiple availability zones, ensuring consistent performance during peak utilization periods. Storage scalability supports massive data warehouses with intelligent tiering systems that optimize costs while maintaining rapid access capabilities.

Integration with Azure Services

Cloud platforms integrate seamlessly with comprehensive ecosystems of complementary services, creating unified healthcare data environments that support advanced analytics and predictive modeling capabilities. Data warehousing services provide processing capabilities that handle substantial healthcare data volumes hourly, enabling real-time analysis of population health trends across multiple sources. These integrations support complex analytical queries that previously required extensive processing time, now executing rapidly with exceptional accuracy rates.

Machine learning services enable sophisticated predictive analytics that analyze numerous variables simultaneously to identify disease outbreak patterns significantly earlier than traditional surveillance methods (Warren Liang, *et al.*, 2025). Artificial intelligence algorithms process streaming data from extensive networks of connected healthcare devices, environmental sensors, and laboratory systems, providing comprehensive situational awareness for public health decision-makers. Predictive models achieve superior accuracy rates for epidemic forecasting compared to conventional statistical approaches.

Internet of Things integration facilitates connections with medical devices and environmental sensors, supporting extensive device networks with high-throughput message processing capabilities. This comprehensive integration enables public health agencies to develop sophisticated surveillance systems

monitoring multiple data streams simultaneously, including environmental monitoring systems and personal health devices. Real-time data processing capabilities correlate environmental data with health outcomes within seconds of ingestion, enabling rapid responses to emerging health threats.

Table 1: Comparative Analysis of Traditional vs. Cloud-Based Healthcare Infrastructure Architecture (ClearDATA . 2025; Warren Liang, *et al.*, 2025)

Infrastructure Component	Traditional On-Premises Approach	Cloud-Based Azure Approach
Security & Compliance Framework	Manual monitoring and periodic assessments	Automated monitoring with continuous HIPAA, HITECH, and FedRAMP compliance protocols
Scaling Capabilities	Weeks required for capacity expansion with significant capital investments	Horizontal scaling within minutes using a microservices architecture without major investments
Data Processing & Analytics	Extensive processing time for complex queries with limited real-time capabilities	Rapid execution with exceptional accuracy rates and real-time population health trend analysis
System Integration	Siloed systems with limited interoperability	Seamless integration with comprehensive ecosystems supporting advanced analytics and predictive modeling
Resource Allocation	Static resource allocation with manual provisioning	Dynamic resource allocation with automated provisioning systems responding to real-time demand patterns

CORE CAPABILITIES AND INTEROPERABILITY FEATURES

Centralized Health Data Aggregation
Cloud-hosted EHR platforms provide public health agencies and integrated delivery networks with comprehensive centralized health data aggregation capabilities spanning multiple facilities, healthcare systems, and geographic regions. Modern data aggregation architectures consolidate information from extensive healthcare facility networks, processing substantial volumes of patient encounters daily across integrated health systems. This centralization enables rapid case reporting with minimal notification delays, sophisticated contact tracing capabilities that can map complex exposure networks efficiently, and comprehensive population health monitoring across diverse healthcare settings serving large populations. The system's data aggregation extends across major hospitals, high-volume ambulatory clinics, laboratories conducting extensive testing operations, and community health centers serving substantial patient populations. Advanced data normalization algorithms ensure exceptional consistency across disparate source systems, while real-time validation processes maintain superior data quality scores for critical public health indicators. Comprehensive temporal data

integration creates extensive longitudinal patient views spanning years of historical health information, enabling sophisticated population health trend analysis and predictive modeling capabilities.

FHIR-Based Interoperability Standards
Modern healthcare platforms implement Fast Healthcare Interoperability Resources standards, representing significant advancements in healthcare data exchange capabilities. FHIR-based interoperability enables seamless bidirectional data exchange between extensive public health registries, comprehensive vaccination systems, sophisticated laboratory information systems, and diverse local health departments serving large residential populations (ECQI. 2025). Standardized FHIR implementations eliminate traditional data silos through automated mapping of extensive clinical terminology codes, ensuring superior semantic interoperability across participating systems.

Real-time FHIR transactions process substantial API call volumes daily with optimal response times for standard resource queries and complex search operations. Integration with federal reporting systems enables automated submission of notifiable disease reports to national health

agencies, processing extensive annual report volumes with exceptional transmission success rates. FHIR-based architectures support robust batch processing capabilities, handling surge reporting scenarios while maintaining data integrity and regulatory compliance throughout transmission processes.

Real-Time Analytics and Business Intelligence

Cloud-integrated analytics platforms enable public health officials to monitor disease trends affecting extensive populations, track vaccine uptake rates across numerous vaccination sites, and analyze social determinants of health using comprehensive standardized metrics. Advanced analytics engines process substantial healthcare data volumes daily to identify emerging health threats, with sophisticated algorithms detecting anomalous patterns rapidly after data availability.

Real-time dashboard capabilities support simultaneous monitoring by extensive networks of public health professionals, displaying continuously updated key performance indicators and supporting detailed drill-down analysis capabilities. Analytics platforms correlate data from numerous source systems, including electronic health records, laboratory systems, pharmacy networks, and environmental monitoring sensors, creating comprehensive situational

awareness dashboards integrating extensive unique data points.

API-Driven Data Exchange

Robust API infrastructures facilitate automated data exchange through comprehensive frameworks supporting extensive standardized endpoints, including REST, SOAP, and GraphQL interfaces. Integration capabilities extend to numerous state health information exchanges, federal reporting systems, and extensive research databases, processing substantial daily API transaction volumes with exceptional uptime reliability (Andrii Pastushok. 2023). API-driven approaches significantly reduce manual data entry requirements, substantially improve data quality scores, and dramatically accelerate public health reporting submission timelines.

Authentication systems support extensive registered API consumer networks across numerous healthcare organizations, with advanced security protocols ensuring comprehensive data protection throughout transmission processes. Sophisticated limiting mechanisms manage API usage while supporting substantial burst capabilities during emergency response scenarios, with comprehensive monitoring systems tracking numerous performance metrics continuously to maintain optimal service level agreements.

Table 2: Essential Interoperability Capabilities of Cloud-Based EHR Systems for Public Health Surveillance

Core Capability Area	Key Technical Features	Public Health Benefits
Centralized Health Data Aggregation	Comprehensive data consolidation from extensive healthcare facility networks with advanced normalization algorithms	Rapid case reporting with minimal delays, sophisticated contact tracing, and comprehensive population health monitoring across diverse settings
FHIR-Based Interoperability Standards	Seamless bidirectional data exchange with automated mapping of clinical terminology codes	Elimination of traditional data silos and superior semantic interoperability across participating healthcare systems
Real-Time Analytics and Business Intelligence	Advanced analytics engines with sophisticated algorithms for anomalous pattern detection	Continuous monitoring of disease trends, vaccine uptake tracking, and comprehensive situational awareness dashboards
API-Driven Data Exchange	Robust infrastructure supporting REST, SOAP, and GraphQL interfaces with comprehensive security protocols	Significant reduction in manual data entry, substantially improved data quality scores, and accelerated reporting timelines
Integration and Scalability	Automated provisioning systems with intelligent tiering and load balancing across multiple availability zones	Enhanced emergency response capabilities during surge scenarios with optimal resource utilization and cost optimization

IMPLEMENTATION CASE STUDIES AND PERFORMANCE METRICS

COVID-19 Response Case Study

A compelling demonstration of cloud-hosted EHR capabilities emerged through the response of a large state health department during a significant COVID-19 resurgence. The implementation

illustrated how modern platforms enabled rapid scaling of testing and reporting operations while simultaneously improving the speed and accuracy of reporting to federal agencies via automated APIs. The deployment covered extensive testing networks across multiple counties, processing data from numerous laboratories and coordinating with thousands of healthcare providers participating in the surveillance network.

The deployment timeline demonstrated remarkable efficiency, with initial system configuration completed rapidly and full operational capacity achieved within days rather than weeks. Database scaling accommodated dramatic data volume increases while maintaining optimal query response times for surveillance activities. The platform's auto-scaling capabilities dynamically allocated computing resources, expanding infrastructure capacity during peak demand periods without manual intervention or system disruption (Jiancheng Ye. 2021).

Implementation results demonstrated significant performance improvements across multiple operational dimensions. The system successfully handled substantial increases in testing volume without performance degradation, supporting concurrent processing of extensive test results during peak operational windows. Storage capacity expanded automatically while maintaining exceptional uptime across all critical services. Automated reporting dramatically reduced federal submission times, with the majority of reports transmitted within hours rather than days of test completion.

API-driven data exchange eliminated manual transcription errors and substantially improved data quality scores, representing significant improvements in overall data accuracy. Automated duplicate detection algorithms identified and resolved thousands of duplicate records, while standardized data formatting ensured exceptional consistency across reporting jurisdictions. Cloud-based scaling eliminated the need for emergency hardware procurement and reduced operational costs substantially, saving millions over the response period while improving personnel productivity through automated workflows.

Mass Immunization Campaign Implementation

The platform's capabilities were further validated through deployment during extensive vaccination campaigns across multiple states, supporting the administration and tracking of millions of vaccine doses over extended periods. The system

coordinated operations across thousands of vaccination sites, including mass vaccination centers, retail pharmacies, mobile units, and healthcare facilities, while maintaining real-time inventory management for multiple vaccine products and tracking adverse events across comprehensive immunization programs.

Implementation metrics demonstrated exceptional scalability, with systems processing substantial daily vaccination rates while maintaining optimal response times for appointment scheduling and dose recording. Platform integration with vaccine management systems enabled real-time inventory tracking across numerous storage locations, preventing stockouts and reducing vaccine wastage compared to previous manual tracking systems. The system's integration capabilities demonstrated versatility in supporting complex public health interventions through seamless coordination between vaccine management systems, patient registries, and adverse event reporting systems.

Environmental Health Monitoring Integration

Cloud-based platforms have been successfully deployed for environmental health surveillance across multiple metropolitan areas, integrating data from extensive networks of air quality monitors, water quality sensors, and climate monitoring systems with health outcomes data from large resident populations (Butpheng, C. *et al.*, 2020). This comprehensive integration enables public health agencies to identify correlations between environmental exposures and health outcomes, supporting evidence-based policy development and targeted interventions across diverse environmental health domains.

Environmental monitoring networks process substantial volumes of sensor data monthly, correlating environmental measurements with health outcomes from numerous healthcare facilities and laboratory systems. Machine learning algorithms analyze hundreds of environmental variables simultaneously, identifying potential health risks with high accuracy and low false positive rates. Automated alert systems notify public health officials of concerning environmental conditions rapidly, enabling immediate responses to air quality emergencies, water contamination events, and extreme weather situations.

Real-time visualization dashboards display environmental and health data across multiple temporal and spatial scales, supporting decision-making by extensive networks of environmental health professionals. Predictive modeling capabilities forecast environmental health risks

with demonstrated accuracy for air quality predictions and waterborne illness risk assessments. At the same time, social media

monitoring systems provide early warning capabilities for emerging environmental health threats.

Table 3: Real-World Implementation Case Studies Demonstrating Cloud-Based EHR Performance in Public Health Scenarios (Jiancheng Ye. 2021; Butpheng, C. *et al.*, 2020).

Implementation Scenario	Key Capabilities Demonstrated	Operational Outcomes Achieved
COVID-19 Response Deployment	Rapid scaling of testing and reporting operations with automated APIs and dynamic resource allocation [7]	Dramatic reduction in federal submission times from days to hours, substantial cost savings through the elimination of hardware procurement
Mass Immunization Campaign	Coordination across thousands of vaccination sites with real-time inventory management and adverse event tracking	Exceptional scalability processing substantial daily vaccination rates, prevention of stockouts, and reduced vaccine wastage
Environmental Health Monitoring	Integration of extensive networks of air quality, water quality, and climate monitoring systems [8]	High-accuracy risk identification with low false positives, rapid response capabilities for environmental emergencies
Data Processing and Analytics	Machine learning algorithms analyze hundreds of variables simultaneously with predictive modeling capabilities	Superior accuracy for air quality predictions and waterborne illness risk assessments, comprehensive situational awareness
System Integration and Coordination	Seamless coordination between multiple healthcare systems, registries, and reporting platforms	Elimination of manual transcription errors, exceptional consistency across reporting jurisdictions, and improved personnel productivity

STRATEGIC IMPLICATIONS AND FUTURE DIRECTIONS

Transformation of Public Health Infrastructure

The deployment of cloud-hosted EHR systems represents more than a technological upgrade, constituting a fundamental transformation of public health infrastructure from reactive to proactive surveillance and response capabilities (Kejriwal, 2025). This transformation enables public health agencies to shift from traditional episodic reporting, which historically captured limited communicable disease cases within critical timeframes, to continuous health monitoring systems that identify potential outbreaks substantially faster than conventional methods.

Current implementations demonstrate the scale of this transformation, with extensive networks of public health agencies utilizing cloud-based EHR integration for surveillance activities (Puthiya, 2024). These systems process substantial volumes of patient encounters monthly, generating extensive datasets for population health analysis. Predictive analytics capabilities have dramatically improved outbreak detection accuracy compared to traditional methods while significantly reducing false positive alerts. The economic impact of this transformation represents substantial savings in avoided healthcare costs through earlier

intervention and improved resource allocation. Traditional public health infrastructure required extended timeframes to coordinate multi-jurisdictional responses, while cloud-integrated systems enable rapid coordination across multiple states and local health departments (Chhibber, 2025). Personnel productivity improvements are substantial across adopting agencies, with epidemiologists dedicating significantly more time to analysis and intervention design rather than data collection activities.

Policy and Regulatory Considerations

The implementation of cloud-based EHR infrastructure for public health surveillance raises important policy considerations regarding data governance, privacy protection, and interagency coordination across extensive networks of participating healthcare organizations and health departments (Alvarez & Marsal.). Current regulatory frameworks require compliance with numerous privacy and security standards, including federal healthcare privacy laws, state privacy regulations, and emerging data protection requirements affecting cross-border health information exchange.

Public health informaticians and policymakers must develop comprehensive frameworks that balance enhanced surveillance capabilities with

individual privacy protections for extensive patient record databases stored in integrated cloud systems. Data governance policies must address consent management for numerous data sharing agreements while maintaining comprehensive audit trails for substantial data access volumes across participating systems. Current privacy protection mechanisms include advanced encryption, role-based access controls, and automated privacy impact assessments (Diaz Munoz, 2025). Interagency coordination frameworks must accommodate data sharing between federal agencies, state health departments, local health agencies, and tribal health organizations. Current agreements enable real-time data sharing for public health emergencies while maintaining strict access controls for routine surveillance activities. Legal frameworks address liability considerations for data breaches, with cloud-based systems demonstrating substantially fewer incidents compared to traditional infrastructure.

Societal Imperative for Health Security

Cloud-based EHR infrastructure has evolved beyond private-sector applications to become a societal imperative for health security, with national preparedness depending on integrated surveillance capabilities. Recent pandemic experiences demonstrated the critical importance of robust public health surveillance systems, with regions utilizing integrated cloud platforms experiencing substantially better health outcomes and faster economic recovery compared to those relying on traditional infrastructure.

Investment analysis indicates substantial returns on cloud-based public health infrastructure investments through reduced healthcare costs, improved productivity, and enhanced emergency response capabilities. Current federal initiatives allocate substantial resources for public health infrastructure modernization, with significant

portions dedicated to cloud-based surveillance and response systems. Private sector partnerships contribute additional technology development and implementation support across extensive networks of health systems and community organizations.

Future Research and Development Directions

Future developments should focus on artificial intelligence integration, incorporating machine learning algorithms for predictive outbreak modeling and resource allocation optimization. Advanced natural language processing capabilities can analyze extensive clinical documentation, extracting population health insights with superior accuracy compared to manual processes. Social determinants analytics expansion requires integration of diverse data sources, including housing, transportation, education, and economic indicators affecting population health outcomes (Baker, M. G., & Fidler, D. P. 2006). Global health surveillance development necessitates standardized data exchange protocols supporting international health organizations and enabling real-time surveillance data sharing among multiple countries. Precision public health capabilities require genomic data integration, environmental exposure mapping, and personalized intervention algorithms supporting diverse health conditions. Current research programs demonstrate substantial effectiveness improvements for targeted interventions compared to population-based approaches.

Target Audience and Stakeholder Engagement

This technical review addresses public health informaticians, policymakers, and digital health planners responsible for modernizing public health infrastructure. The evidence demonstrates comprehensive solutions for addressing complex challenges of contemporary public health surveillance and response across diverse healthcare organizations and jurisdictions.

Table 4: Strategic Transformation Framework for Cloud-Based Public Health Infrastructure Development (Alvarez & Marsal.; Baker, M. G., & Fidler, D. P. 2006).

Strategic Domain	Current Implementation Status	Future Development Priorities
Public Health Infrastructure Transformation	Shift from reactive episodic reporting to continuous health monitoring with improved outbreak detection accuracy	Enhanced predictive analytics capabilities with substantially faster outbreak identification and reduced false positive alerts
Policy and Regulatory Framework	Compliance with numerous privacy and security standards, including federal healthcare privacy laws and emerging data protection requirements	Comprehensive frameworks balancing enhanced surveillance capabilities with individual privacy protections and interagency coordination
Health Security and National	Demonstrated substantially better health outcomes and faster economic recovery in	Societal imperative requiring substantial federal resources allocation and private

Preparedness	regions utilizing integrated cloud platforms	sector partnerships for comprehensive modernization
Advanced Technology Integration	Current machine learning capabilities for outbreak modeling and natural language processing for clinical documentation analysis	Artificial intelligence integration, social determinants analytics expansion, and precision public health capabilities
Stakeholder Engagement and Implementation	Extensive networks of public health agencies utilize cloud-based EHR integration for surveillance activities	Comprehensive solutions addressing complex contemporary public health surveillance challenges across diverse healthcare organizations

CONCLUSION

The deployment of cloud-hosted EHR systems for public health surveillance represents a paradigmatic transformation that fundamentally alters how health agencies monitor, analyze, and respond to population health threats in contemporary healthcare environments. This technological evolution transcends traditional infrastructure limitations by providing scalable, interoperable, and analytically sophisticated platforms that enable proactive surveillance capabilities rather than reactive response mechanisms. The platform's proven performance during real-world deployments, including pandemic responses, mass immunization campaigns, and environmental health monitoring initiatives, demonstrates exceptional potential to revolutionize public health practice through enhanced data integration, improved reporting accuracy, and accelerated decision-making processes. Cloud-native architectures with microservices design principles enable dynamic resource allocation and horizontal scaling capabilities that accommodate surge scenarios without requiring substantial capital investments or extended deployment timelines. FHIR-based interoperability standards eliminate data silos and enable seamless integration between clinical care delivery systems and population health management platforms, creating comprehensive surveillance networks that span multiple jurisdictions and healthcare settings. The convergence of artificial intelligence, machine learning, and cloud computing technologies enables sophisticated predictive modeling capabilities that identify disease outbreak patterns significantly earlier than traditional surveillance methods. Future developments in precision public health, social determinants analytics, and global health surveillance will further enhance the platform's capabilities to address complex challenges of modern public health infrastructure. As health agencies continue modernizing surveillance and response capabilities, cloud-hosted EHR platforms provide robust, scalable,

and cost-effective solutions that address critical needs for real-time population health intelligence and rapid emergency response capabilities essential for protecting public health security.

REFERENCES

1. We Market Research, "Electronic Health Records Market Share, Size, Trends, Industry Analysis," (2025). [Online]. Available: <https://wemarketresearch.com/reports/electronic-health-records-market/1739>
2. NetApp, "Data Now: Improving Performance in Epic EHR Environments with Cloud-Connected Flash Technology." [Online]. Available: <https://www.netapp.com/media/10809-cloud-connected-flash-wp.pdf>
3. ClearDATA, "A Complete Guide to Healthcare Security & Compliance in the Cloud," (2025). [Online]. Available: <https://www.cleardata.com/blog/guide-to-healthcare-compliance-in-the-cloud/>
4. Warren Liang, et al., "Machine Learning for Public Health Analytics," ResearchGate, (2025). [Online]. Available: https://www.researchgate.net/publication/387794757_Machine_Learning_for_Public_Health_Analytics
5. ECQI, "FHIR® - Fast Healthcare Interoperability Resources®," (2025). [Online]. Available: https://ecqi.healthit.gov/fhir?qt-tabs_fhir=about
6. Andrii Pastushok, "API Integration in Healthcare: Enabling Seamless Data Exchange," *Sigma Software*, (2023). [Online]. Available: <https://sigma.software/about/media/api-integration-in-healthcare-enabling-seamless-data-exchange>
7. Jiancheng Ye, "Health Information System's Responses to COVID-19 Pandemic in China: A National Cross-sectional Study," *Appl Clin Inform*, (2021). [Online]. Available:

- <https://pmc.ncbi.nlm.nih.gov/articles/PMC8133837/>
8. Butpheng, C., Yeh, K. H., & Xiong, H. "Security and privacy in IoT-cloud-based e-health systems—A comprehensive review." *Symmetry* 12.7 (2020): 1191.
 9. Alvarez & Marsal, AWS INSTITUTE, "Cloud data governance and best practices for public healthcare cloud adoption in Asia Pacific." [Online]. Available: <https://d1.awsstatic.com/institute/Health-Data-Governance.pdf>
 10. Baker, M. G., & Fidler, D. P. "Global public health surveillance under new international health regulations." *Emerging infectious diseases* 12.7 (2006): 1058.
 11. Diaz Munoz, P. A. "Advancing architectural visualization: The impact of 3D modeling and rendering on design communication." *IPHO Journal of Advance Research in Science and Engineering* 3.8 (2025): 1–9.
 12. Puthiya, D. "Digital portfolio optimization in agile product development environments." *IPHO Journal of Advance Research in Science and Engineering* 2.2 (2024): 1–9.
 13. Kejriwal, A. "Strategic alignment of digital and print media in marketing campaigns." *Journal of International Crisis and Risk Communication Research* 8.S12 (2025): 595–603.
 14. Chhibber, R. "Strategic P&L accountability in enterprise growth-oriented organizations." *Sarcouncil Journal of Public Administration and Management* 4.3 (2025): 8–16.

Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Kanimetta. D. K. "Empowering Public Health Surveillance and Response Through Epic on Azure." *Sarcouncil Journal of Multidisciplinary* 5.6 (2025): pp 61-69.