CyberRX: Health Plans Cyber Simulation Exercise

After-Action Report

December 2015
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**Executive summary**

CyberRX is a series of no-cost, industry-wide exercises created and coordinated by HITRUST in conjunction with the Department of Health and Human Services (HHS), with the mission to mobilize healthcare organizations and explore innovative ways of improving preparedness and response against cyberattacks intended to disrupt the nation’s healthcare operations. *CyberRX: Health Plans is a cyber simulation exercise designed specifically for health plans and insurers. The exercise was facilitated and observed by Deloitte Advisory.*

### Exercise overview

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<th>Objective</th>
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<td>To provide participants the opportunity to test their cyber incident readiness and to identify ways to enhance existing cyber incident response plans and processes</td>
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<th>Participants</th>
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<td>250 individuals from 12 health plans across 13 US states</td>
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<th>Delivery structure</th>
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<td>During a four-hour session, participants responded to systematically delivered cyber incident simulation content, discussing necessary response actions and key decisions to be made</td>
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<th>Simulation scenario</th>
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<td>A threat actor compromised the systems of a fictitious health plan company, gaining access to member protected health information (PHI) and initiating fraudulent health claims on a mass scale</td>
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### Participant learnings

**The nature of cyber incidents**
- Cyberattacks are becoming increasingly pervasive and sustained, and can quickly escalate into significant business crises.
- Open and accurate lines of communication are critical components of incident response and should consider internal parties, third parties, law enforcement and government agencies

**The cyber incident lifecycle**
- Cyber incidents can take months or years to recover from – recovery objectives must factor in both capabilities enhancements as well as confidence enhancements
- Incident response requires cross-functional coordination, documentation, and stakeholder communication

**Planning for cyber**
- It is imperative that incident response plans include specific communication and team processes
- Simple, flexible and distributed plans provide guidance to responsible parties throughout the organization
- Understand where and when outside help is needed to assist and have a way of getting these capabilities beforehand
- Regularly conducting cyber simulations will build muscle memory among cyber incident responders
In April 2015, HITRUST, Deloitte Advisory, and a planning committee initiated planning for the *CyberRX: Health Plans Cyber Simulation Exercise* with the goal of exercising the capabilities of a group of health plans to respond to a wide-scale cyberattack.

**Exercise motivation**

Recent events have raised awareness of the increase in cyber threats and attacks targeted at the health plan industry. Cyberattacks provide little forewarning and can occur suddenly or over a period of time. This variability requires health plans to focus on cyber incident readiness, response, and recovery.

**About CyberRX**

*CyberRX 2.0*

*CyberRX 2.0* is a scenario-based exercise program to assess the cybersecurity response preparedness of healthcare organizations.

**The Team**

The *CyberRX* program is overseen by a steering committee comprised of representatives from the healthcare industry, HITRUST, and HHS.

**Purpose of CyberRX**

1. *To improve cybersecurity maturity across the healthcare industry*

2. *... in response to growing concerns and threats to the healthcare industry*

3. *... as a complimentary benefit to all HITRUST members*
The CyberRX: Health Plans Cyber Simulation Exercise was a four-hour event designed to explore the current state of health plan industry resilience and to achieve four key objectives:

1. Test organizations’ abilities to detect, comprehend, and respond to cyber incidents
2. Practice cyber incident response and identify effective practices for the health plan industry
3. Highlight the roles of HITRUST, HHS, and health plan industry partners before, during, and after cyber incidents
4. Identify areas for improvement for industry-wide cyber resilience
Exercise design – *delivery model*

**BLUE TEAM**
Wargame players that responded to exercise injects

**WHITE TEAM**
Wargame facilitators that managed direction, pace and content of the exercise

**GREEN TEAM**
Onsite referees that worked with the facilitators to manage the exercise

**GRAY TEAM**
Stakeholders that observed player decisions and actions

**LEGEND**
- Deloitte Advisory Game Center
- Health Plan
- Participant
- Collaboration Link

12 Health Plans • 250 Participants • 13 US States
Exercise design – *simulation scenario*

The *CyberRX: Health Plans Cyber Simulation Exercise* simulated an unauthorized access to claims processing and fraud analytics engines. In the process, the perpetrator gained access to member protected health information (PHI) and subsequently submitted fraudulent health claims.

1. Following a premeditated carjacking, a laptop is stolen from an employee of a third-party vendor.
2. A cyber criminal organization gains access to patient records and the fraud analytics engine.
3. Back-end of fraud analytics engine is altered to approve targeted false claims.
4. False insurance claims are submitted and approved.
5. Claims payments sent to fictitious providers result in millions of dollars in losses.
6. Members receive record of claims indicating payment for services which were never rendered. False claims reported to call center by the members.
7. Fraudulent claims volume ramps up across multiple health plans as personally identifiable information (PII) and PHI files are sold on the black market.
Observations – *overall successes*

The *CyberRX: Health Plans Cyber Simulation Exercise* effectively tested many of the industry-wide cyber incident response and crisis management processes and protocols that the health plan industry has worked to improve over the last several years.

**The exercise amplified awareness among industry participants – effectively illustrating the value of working together to address cyberattacks**

**Within participating health plans, the simulation brought together key members of business, operations, technology, security, privacy, communications, legal, compliance, and crisis management teams, and allowed them to exercise their cyber incident response and escalation processes**

**Ongoing public-private partnerships between the health plans, HITRUST and HHS were furthered, demonstrating the critical role these partnerships play in protecting the industry**

**As the incident unfolded, the HITRUST Cyber Threat Exchange (CTX) shared critical intelligence highlighting its role in supporting effective industry-wide information sharing**
### Observations

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<tr>
<th>Third Parties</th>
<th>Game injects implicated a third-party vendor and most participant health plans acted decisively in contacting the vendor and reviewing contracts. The third party was non-responsive, leading to general frustration. Interestingly, most plans did not proactively create third-party communications of their own.</th>
<th>Increased reliance on and integration with third parties require tight integration between third-party risk management functions and cyber incident response programs. Program reviews and joint exercises are critical components to third-party oversight efforts.</th>
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<td>Analysis vs. Response</td>
<td>Some health plans were challenged by the lack of technical detail related to the source of the incident. These organizations focused on forensic analysis over assessing business impacts and engaging key stakeholders.</td>
<td>During cyber incidents, the demand for information far outpaces the supply. Decisions may be required with incomplete information. Engaging a variety of perspectives improves decision-making when information is incomplete.</td>
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<td>Command Structure</td>
<td>Strong personalities tended to dominate conversations when gameplay required decisions not covered in existing command structures and plan documents. These personalities often drove decisions outside of their defined responsibilities.</td>
<td>During the course of an incident, natural leadership skills may emerge. Embracing initiative and driving response must be balanced against effective governance and incident command.</td>
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<td>Cyber Insurance</td>
<td>Cyber insurance claims were a frequent consideration, however a general lack of certainty about response and reporting requirements, loss quantification, and claim submission was observed.</td>
<td>Cyber insurance is an evolving industry with notable variances across insurers and policies. Aligning policy requirements to cyber incident response plans can allow for effective data gathering and reporting processes.</td>
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<td>Fact or Fiction</td>
<td>Several injects were designed to introduce noise into gameplay. Many participants took this content at face value and moved to react and respond. Assumptions made during gameplay were often taken as fact, leading to decisions based on conjecture.</td>
<td>Vetting data points, gathering different perspectives, and documenting assumptions and actions can aid in distinguishing the signal from the noise.</td>
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<tr>
<td>Category</td>
<td>Observations</td>
<td>Perspectives</td>
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<td><strong>Industry Communications</strong></td>
<td>Three organizations were simulated in the exercise injects: HITRUST; a fictitious health plan named ResponseHealth; and a shared third-party vendor. Proactive engagement from game participants to these organizations was minimal.</td>
<td>Despite calls for increased industry collaboration, active collaboration remains elusive. Further development of formalized engagement protocols is recommended.</td>
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<td><strong>Internal Communications</strong></td>
<td>Participating health plans varied significantly in communication outside of technical teams. In organizations where business engagement was limited, decisions were made based purely on technical information.</td>
<td>Clear, direct, frequent, and scheduled communications are critical to supporting an effective cadence and informing business, operational, and technical strategic decision-making.</td>
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<td><strong>Law Enforcement</strong></td>
<td>Several participating health plans engaged law enforcement early in the process when no evidence of a crime had been established. Many of these participants did not have a clear plan for how to engage and what information would be provided.</td>
<td>Engaging law enforcement can aid in evidence compilation and preservation, however acting too soon may lead to a loss of control over the incident investigations, response, and recovery.</td>
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<td><strong>Plan and Training</strong></td>
<td>All health plans had cyber incident response plans available but only two participants referenced the documents during game play.</td>
<td>While the pace of play did not support strict adherence to comprehensive plan documents, cyber incidents similarly escalate at a rapid pace. Quick reference guides drive information accessibility and support informed and time-sensitive decision-making during training exercises and live fire.</td>
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<td><strong>Regulatory Compliance</strong></td>
<td>Few participants took action to report the breach when regulatory thresholds for notification were reached.</td>
<td>Incident response teams should be aware of regulatory landscape in order to maintain compliance and protect the organization from litigation. Training and cyber wargames are important program compliance elements.</td>
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Recommendations – *industry-wide*

The exercise identified opportunities to improve incident response and crisis management procedures by strengthening coordination among the industry participants.

**Industry-wide incident command structure and processes**

- Establish formal procedures that stress the integration of cyber incident response plans across industry groups, health plans, and HHS
- Elevate the role HITRUST and trusted government partners play in health plan cyber incident readiness, response, and recovery activities
- Increase awareness about government and law enforcement resources available to assist the health plan sector by designing training programs centered on appropriate engagement

**Systemic risk assessment and decision processes**

- Establish effective escalatory paths between business and technology leaders during cyber incident analysis and response
- Invest in capabilities to support risk analytics, information sharing, and crisis communications

**Communication and information sharing**

- Enhance protocols that promote increased communication and information sharing among health plans
- Formalize public awareness and communications strategies with a view to promoting trust and confidence in the health plan industry
- Institutionalize procedures for integrating cyber insurance partners and third-party vendors in incident response plans
- Continue maturation of ongoing cyber threat distribution by increasing awareness of public-private information sharing paths and industry cooperation with law enforcement
Recommendations – *individual health plans*

Results of individual health plan surveys and compiled observer notes identified additional opportunities to improve incident response and crisis management procedures.

**Was your current incident response plan adequate to protect your members and organization during this cyber incident scenario?**

- **Strongly Disagree**
- **Strongly Agree**

**Recommendations**
- Regularly exercise and update incident response plans to increase success and organizational confidence
- Incorporate lessons learned from exercises into plans and playbooks
- Train key stakeholders and resources in plan requirements to identify gaps in capabilities and increase staff and organizational cyber incident readiness

**Do you have clear communication flows within your organization and with external parties?**

- **Strongly Disagree**
- **Strongly Agree**

**Recommendations**
- Implement a communications plan covering all internal and external (including governmental) key stakeholders
- Identify appropriate spokespersons for each of the key stakeholder groups and align messaging to audience
- Assess the effectiveness of communication plans to all stakeholders through separate communications tests and within cyber wargame activities

**Do you see a need to improve your cyber response capabilities?**

- **Strongly Disagree**
- **Strongly Agree**

**Recommendations**
- Align cyber incident response activities with other organizational resilience efforts including crisis management, business continuity, disaster recovery, and emergency response
- Create quick reference guides to improve rapid response capability
- Establish a Cyber Incident Response retainer to provide surge support for time-sensitive technical investigation and forensics activities
Recommendations – \textit{disparity of perception}

Results of individual health plan surveys and compiled observer notes identified additional opportunities to improve cyber wargaming activities.

\begin{tabular}{|c|c|}
\hline
\textbf{What participants said} & \textbf{What we saw} \\
\hline
Do you feel your organization had clearly delineated roles and responsibilities as the simulation progressed? & • Observers noted that some plans struggled with roles and responsibilities outside of technical teams. \\
[Strongly Disagree] & [Strongly Agree] \\
Strongly Disagree & Strongly Agree \\
\hline
Do you feel you have the individuals with the required skill set in your organization to respond to a cyber incident? & • Limited engagement of third parties including industry contacts, regulatory bodies, and law enforcement suggests a need to document points of contact and rules of engagement. \\
[Strongly Disagree] & [Strongly Agree] \\
Strongly Disagree & Strongly Agree \\
\hline
\end{tabular}

Answers to direct & attributable survey questions varied significantly from independent observations and informal commentary offered during gameplay.

Exercises and cyber wargames should incorporate formal and informal methods for gathering honest feedback.

• Continue to use independent third-party observers to ensure that frank and independent observations and recommendations are provided.

• Use anonymous surveys and/or interviews from internal participants to provide more accurate, aggregated metrics against key performance and result indicators.

• Periodically immerse cyberattack responders in a simulated and interactive cyberattack scenario to allow organizations to honestly evaluate their cyber incident response preparedness and identify cyber incident response capability gaps.
Key takeaways – *confidence vs. capabilities*

At the most strategic level, recovering from a cyber incident involves an important balance between recovering or enhancing capabilities and restoring confidence among a broad spectrum of stakeholders.

### Capabilities Considerations

- **Business and operational** capabilities are disrupted when cyberattacks disable technology solutions
- **Information technology** capabilities inform decision-making and support critical business processes
- **Cyber risk** capabilities secure the environment, provide better visibility into ongoing threats, and reduce the impact of future attacks

### Confidence Considerations

- **Customers and members** are immediately concerned with direct personal impacts
- **Employees** can be overwhelmed by negative publicity and increased chaos
- **Business partners** are concerned with the threat of cross-contamination and long-term integrity
- **Regulators** monitor consumer protection, existential threats, and broad industry impacts

### Results

At the conclusion of the exercise participants were asked to prioritize long-term recovery efforts by selecting from a range of strategic initiatives. Each option presented focused either on recovering capabilities or rebuilding stakeholder confidence.

5 of the 12 plans focused on rebuilding **capabilities**. Confidence restoration is critical to minimizing brand and reputational impacts.

- 4 plans prioritized **confidence** initiatives. Capability enhancements are necessary to sustain confidence gains.
- 3 plans **balanced** the restoration of capabilities and confidence.
Acknowledgements

**Supporting organizations**

- Deloitte Advisory

**Program Committee**

- Health Information Trust Alliance (HITRUST)
- US Department of Health & Human Services (HHS)
- Blue Cross Blue Shield of Michigan
- Health Care Services Corporation
- Highmark Health
- Humana
- United Health Group
Establishing risk-driven incident response capabilities

Health Plan executives set risk appetite and drive focus on what matters most. It starts by understanding who might want to attack, why, and how.

Who is the threat?
- Cyber criminals
- Terrorists
- Hactivists (agenda-driven)
- Nation state
- Insiders / partners
- Competitors
- Skilled individual hacker

What are they after?
- Theft of intellectual property, personal information or strategic plans
- Financial fraud or theft
- Reputation damage
- Business disruption
- Drive corporate decisions and/or behavior

What tactics might they use?
- Governance and operating model
- Policies and standards
- Management processes and capabilities
- Risk reporting
- Risk awareness and culture

Cyber Risk Program and Governance

SECURE
Are controls in place to guard against known and emerging threats?

VIGILANT
Can we detect malicious or unauthorized activity, including the unknown?

RESILIENT
Can we act and recover quickly to minimize impact?

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Next steps

• The data collected from this and other CyberRX exercises is used to define and enhance future exercises and programs

• We encourage organizations to participate in a CyberRX exercise

• For more information on the CyberRX program visit hitrustalliance.net/cyberrx/

For additional information about the 2015 CyberRX: Health Plans Cyber Simulation Exercise or building Secure.Vigilant.Resilient.™ organizations, contact:

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About HITRUST

Founded in 2007, the Health Information Trust Alliance (HITRUST) was born out of the belief that information protection should be a core pillar of, rather than an obstacle to, the broad adoption of health information systems and exchanges. HITRUST, in collaboration with public and private healthcare technology, privacy and information security leaders, has championed programs instrumental in safeguarding health information systems and exchanges while ensuring consumer confidence in their use.

HITRUST programs include the establishment of a common risk and compliance management framework (CSF); an assessment and assurance methodology; educational and career development; advocacy and awareness; and a federally recognized cyber Information Sharing and Analysis Organization (ISAO) and supporting initiatives.

www.HITRUSTalliance.net

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