Are You Prepared for the Emerging & Trending Cybersecurity Threats?

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Learning Objectives

- Identify the most pressing cybersecurity concerns and trends that healthcare provider organizations face today
- Describe strategies for mitigating risk associated with cyber threats
- Implement proven strategies for creating cyber risk awareness

CynergisTek, Inc.

Founded in 2004

CynergisTek has been providing services to our clients since 2004, but many of our clients have been with one or both of the founders since well before the company was founded.

Consulting Services

CynergisTek provides consulting services and solutions around information security, privacy, IT architecture, and audit with specific focus on regulatory compliance in healthcare.

Synergistic

The name “CynergisTek” came from the synergy realized by combining the expertise of the two co-founders – building scalable, mature information security programs and architecting enterprise technical solutions.

Securing the Mission of Care

CynergisTek services are specifically geared to address the needs of the healthcare community including providers, payers, and their business associates who provide services into those entities.

Today's Presenter

- Co-founder & CEO CynergisTek, Inc.
- Chair, HIMSS P&S Policy Task Force
- CHIME, AEHIS Advisory Board
- Healthcare Most Wired Advisory Board
- HCPro Editorial Advisory Board
- HealthInfoSecurity.com Editorial Advisory Board
- Top 10 Influencers in Health IT 2013
- Top 50 Leaders in Health IT 2015
- Director of Security, DoD
- Excellence in Government Fellow
- US Marine Intelligence Officer, Retired

Mac McMillan
FHIMSS, CISM
CEO, CynergisTek, Inc.

Why Information Security is Challenging in Healthcare

- **The prime directive**. First priority is taking care of patients, and we need quick and easy access to information to do that.
- **Innovation**. A never-ending stream of new IT products and services are promising to improve the delivery of care.
- **Complexity**. Hundreds to thousands of applications must work together seamlessly, but also must be secured.
- **Costs**. Healthcare organizations are under pressure to reduce costs, making more spending to address security a tough sell.
- **Convergence**. Healthcare aggregates all forms of sensitive information; PHI, PII, PCI, etc.

Why Healthcare Workers Should Care About Information Security

- Protecting the personal data that we are entrusted with is the right thing to do, and in fact it's even part of the Hippocratic Oath!
  - *I will respect the privacy of my patients, for their problems are not disclosed to me that the world may know.*
- It's the law. In fact, there are multiple laws that affect healthcare organizations: HIPAA, HITECH, Meaningful Use, FISMA, FERPA, State Laws etc…
- ***But Most Important*: Information security risks are now undermining healthcare's intellectual property, brand, and mission, and threatening patient care and safety in the process.**

Cybersecurity Risk

Strategic	**Goals of the Organization**
Operational	**Processes that Achieve Goals**
Financial	**Safeguarding Assets**
Compliance	**Laws and Regulations**
Reputational	**Public Image**

The Threat Changes

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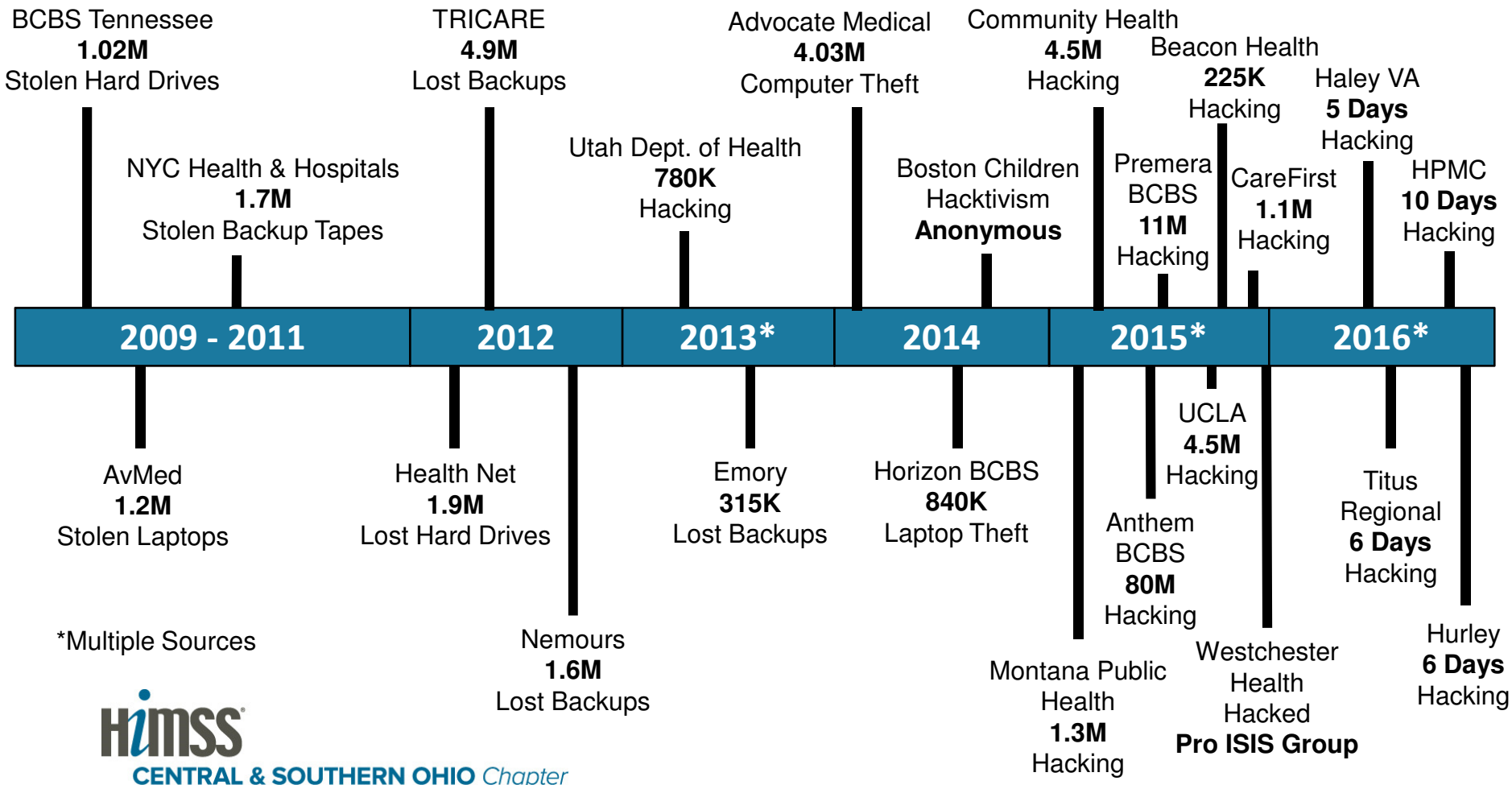
Evolving Healthcare Threat Landscape

From lost/stolen devices to hacking



*Multiple Sources

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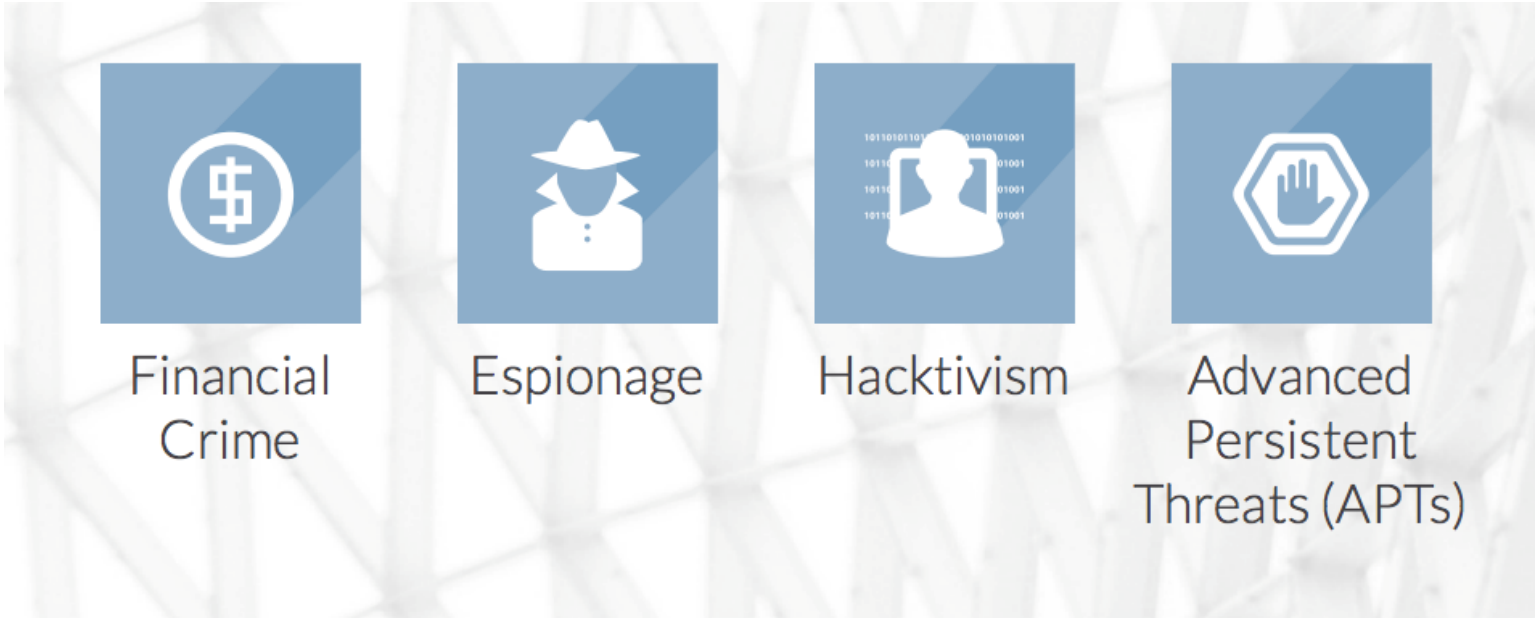
The Many Faces of Threat



*Source: Understanding Cyber Attackers and their Motives. FireEye.

The Evolution of Attacks

Across the Cyber Threat Landscape

Cyber threat actors are exploiting networks for an ever-widening array of economic and political objectives.

	NUISANCE	DATA THEFT	CYBER CRIME	HACKTIVISM	DESTRUCTIVE ATTACK
Objective	Access & Propagation	Economic, Political Advantage	Financial Gain	Defamation, Press & Policy	Disrupt Operations
Example	Botnets & Spam	Advanced Persistent Threat Groups	Credit Card Theft	Website Defacements	Delete Data
Targeted	✗	☑	☑	☑	☑
Character	Often Automated	Persistent	Frequently Opportunistic	Conspicuous	Conflict Driven

Source: Mandiant M-Trends 2015: A View from the Front Lines.

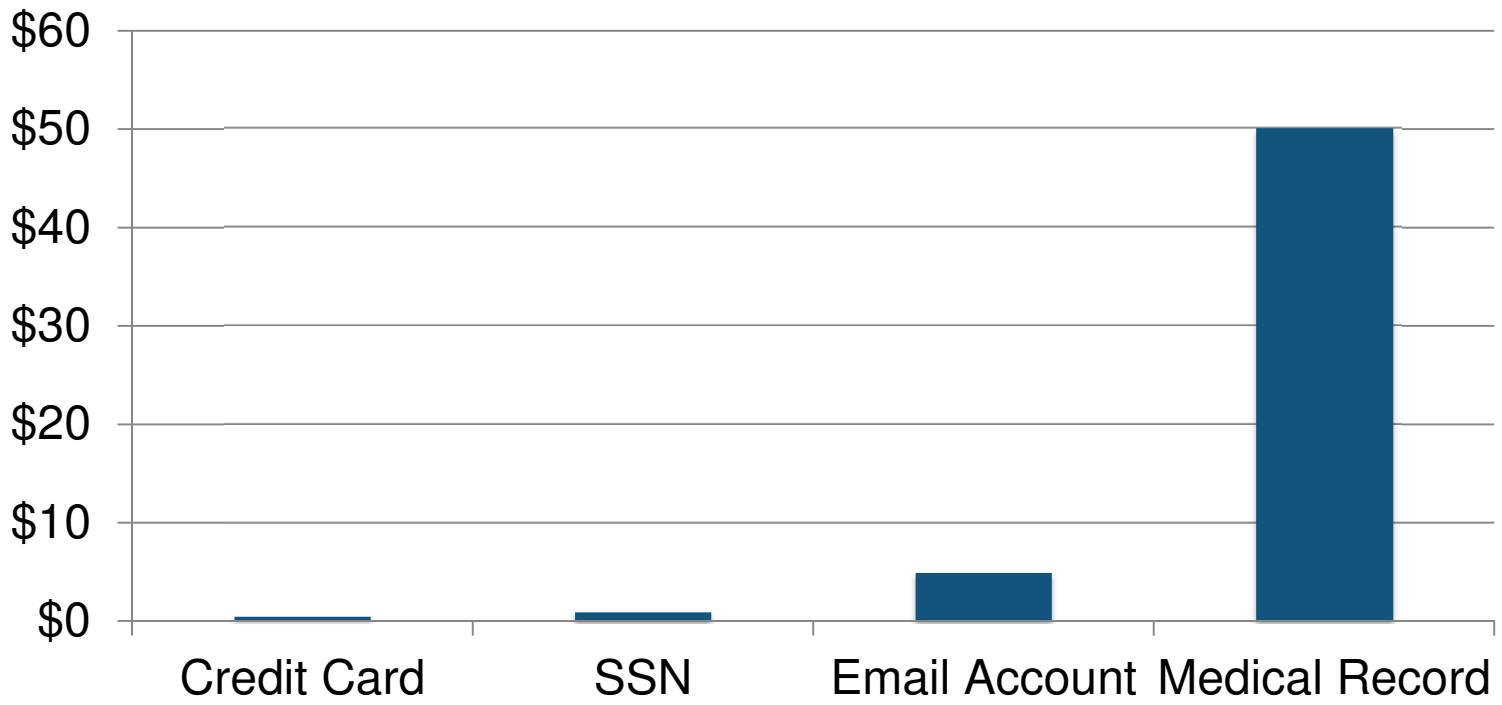
Cybercrime as a Business

Trends in cybercrime all make cyber-criminals more effective

- Cybercrime-as-a-service model* gives less technically-savvy criminals access
- Dark web marketplaces make “monetizing” stolen data as easy as buying on Amazon
- Cybercriminals are adopting tactics previously only used by nation-state attackers

*Source: Cybercrime 2015. An Inside Look at the Changing Threat Landscape. RSA, 2015.

Black Market Value of Stolen Data



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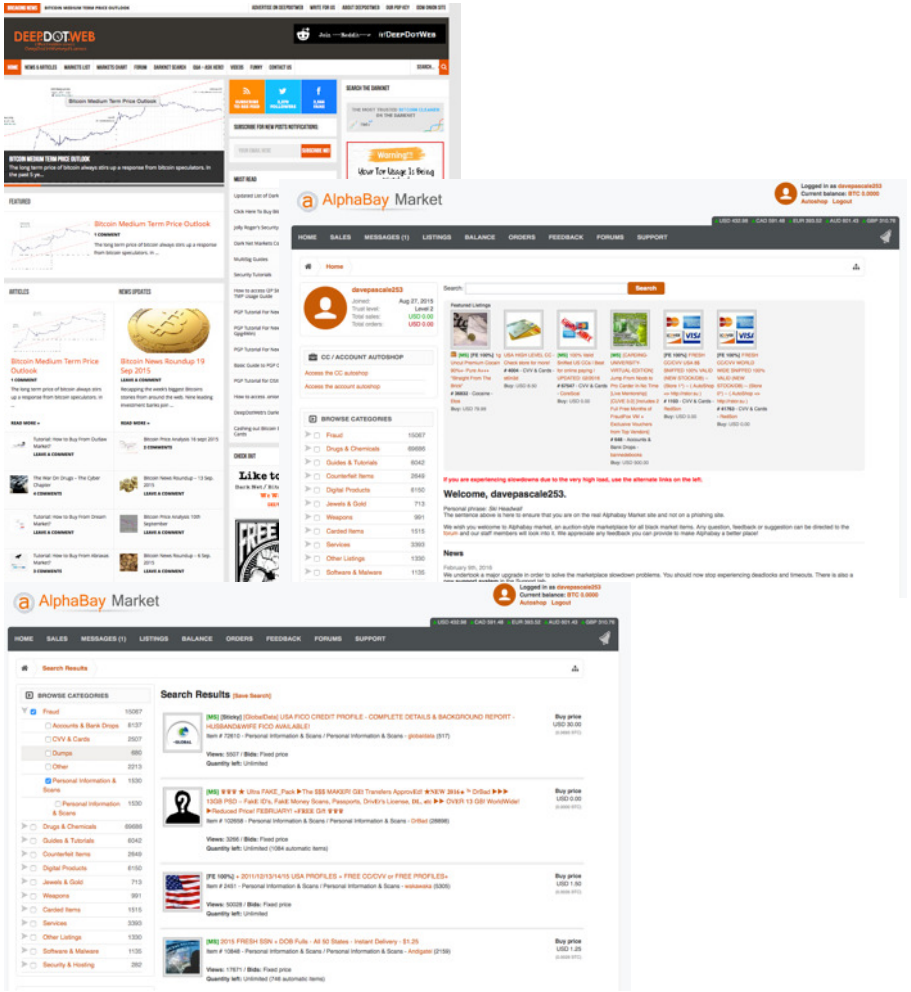
Sources: http://histalkmobile.com/2014-a-perfect-storm-for-data-breaches/
http://krebsonsecurity.com/2013/06/the-value-of-a-hacked-email-account/

Dark Web Marketplace

A Bitcoin wallet, PGP for encrypted communication, and a TOR browser and you are in business…



Cyber Extortion is Rampant

- First appeared around 2005
- Two forms: Crypto ransomware (data) and Locker ransomware (system)
- Sophisticated attacks use:
  - New asymmetric keys for each infection
  - Industrial strength & private/public key encryption
  - Privacy enabling services like TOR and bitcoins for payments
- Indifferent to target, everyone is a target (home/business)
- Malvertising, spam email, downloaders/botnets & social engineering

Cyber Espionage is Growing

Cyber espionage is being carried out by nation-state actors for political purposes

- Large breaches such as Anthem, Premera, Community Health Systems, UCLA are suspected cases of espionage
- A case example is the OPM intrusion presumed by a Chinese group that captured security clearance documents
- But…they are also targeting industrial control systems that control and manage critical infrastructure

Hacktivism

Attacking for a cause

- Anonymous hacked Boston Children's in 2014 over a child parental rights case
- GhostShell attacked several U.S. universities in 2015 leaking sensitive information
- Anonymous hacked Hurley Medical Center in 2016 over the Flint Michigan water issue
- Pro ISIS groups have hacked hospital websites

Targeted (APT) Attacks

Typically nation-state attack groups

- “APTs are known for being highly sophisticated, using multiple vectors to attack a target network, and having unrelenting tenacity”
- Many attacks go undetected for considerable periods of time, estimated 280 days on average
- Phishing, zero day attacks, ransomware have increased dramatically in 2016

“There is widespread agreement that advanced attacks are bypassing our traditional signature-based security controls and persisting undetected on our systems for extended periods of time. The threat is real. You are compromised; you just don’t know it.” – Gartner Inc., 2012

* Source: Understanding Cyber Attackers and their Motives. FireEye, 2015.

What Are Vendors Doing With PHI?

May 2014

- *"There you are, I was tracking you."*
- The taxi-hailing commuter platform Uber had two breaches in 2014 that weren't reported until 2015 gaining the ire of the New York SAG.
- What they did:
  - First they allowed internal users access to riders PII and displayed it through a tracking system called "God View".
  - Second they had a breach of their riders data base that permitted a third party access to 50,000 riders PII on GitHub.
- The settlement requires Uber to employ encryption, better access controls and multi-factor authentication.
- Health Systems are partnering with Uber to help patients not miss appointments.

How Secure Are Vendor Solutions?

December 2015

- Juniper admits Netscreen firewalls have been vulnerable for 8+ years.
- Juniper continued to use compromised Duel_EC encryption even after NIST and others recommended discontinuance.
- Juniper added Dual_EC to its firmware in 2008.
- Investigators are trying to determine if this was random, but do not believe it was.
- Regardless Juniper did not move to fix until outed by researcher.

Closing the Gap

Security is the ceiling.

Leadership are the walls that bring security and compliance together.

Compliance is the floor.

How to Respond

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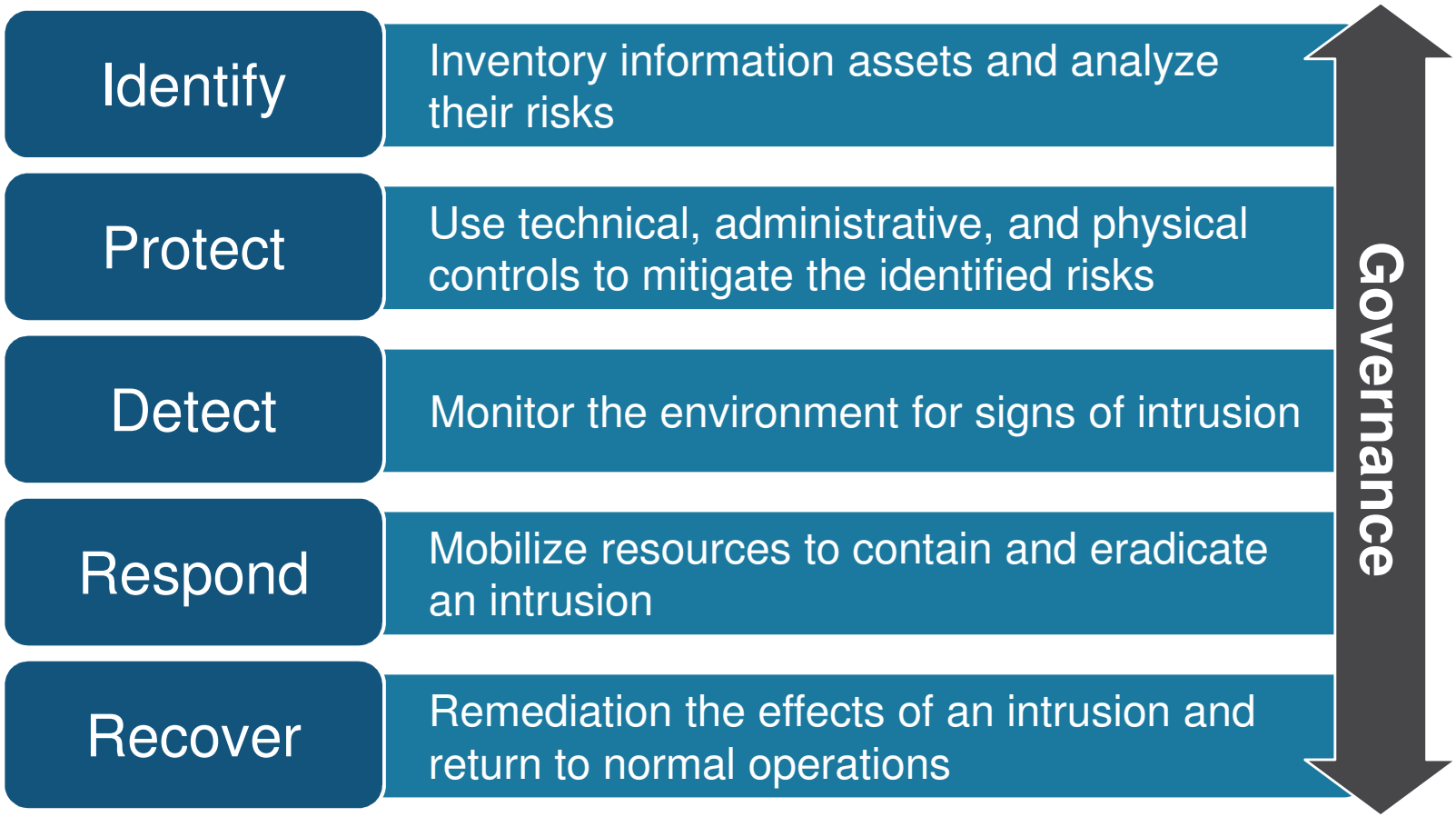
Knowledge: Anatomy of a Cyber Attack

Frameworks: A Common Taxonomy

- Describing an organization's **current** cybersecurity posture
- Describing its **target state** for cybersecurity
- Identifying and **prioritize** areas of improvement
- Employing a **repeatable** process for review
- Continuously **assessing** its cybersecurity posture
- **Communicating** cybersecurity risks to both internal and external stakeholders
- Conducting regular **measurements** of control effectiveness
- **Demonstrating** compliance

A Holistic Approach to Data Security



Reference: NIST Cybersecurity Framework

Adopt an Offensive Posture

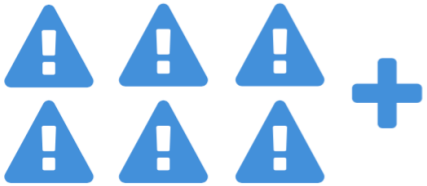
- ***Educate and inform***, ensure users know how to identify and avoid common threats
- ***Remain current***, refresh, harden, patch and manage system configurations with diligence
- ***Employ layers***, protections at the endpoint, network, file layers, etc. can make it more difficult for hackers
- ***Deploy complimentary controls***, use both signature or rule based solutions with heuristic solutions
- ***Enhance detection***, deploy NGFWs, malware filters, A/V filters, IDS/IPS, etc.
- ***Prioritize contingency planning***, back up everything, offline as well, practice incident response
- ***Be ready***, establish relationships, acquire tools
- ***Be objective***, use independent third parties to perform readiness audits, tests and assessments

The United States is the largest target worldwide by a huge margin when it comes to advanced persistent threats.

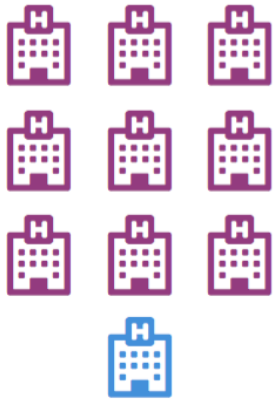
Where Do We Start? Risk Assessment…

Expect a Smart Defense

38% have had more than five incidents.

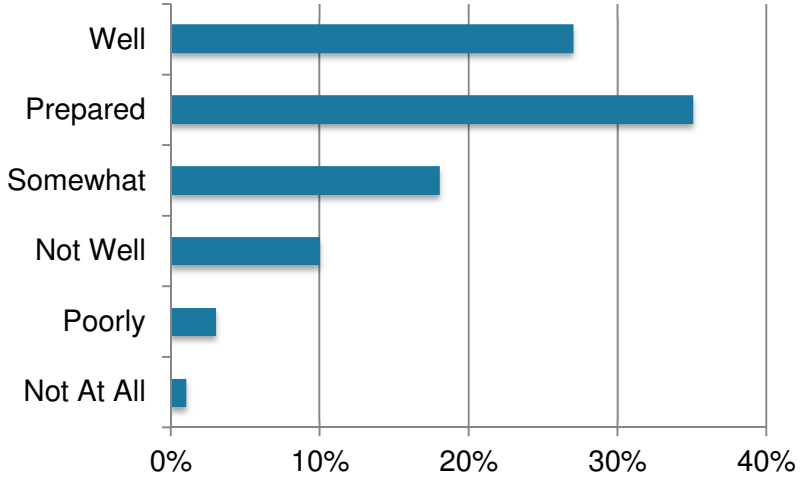


90% of healthcare organizations have experienced at least one data breach in the past two years.

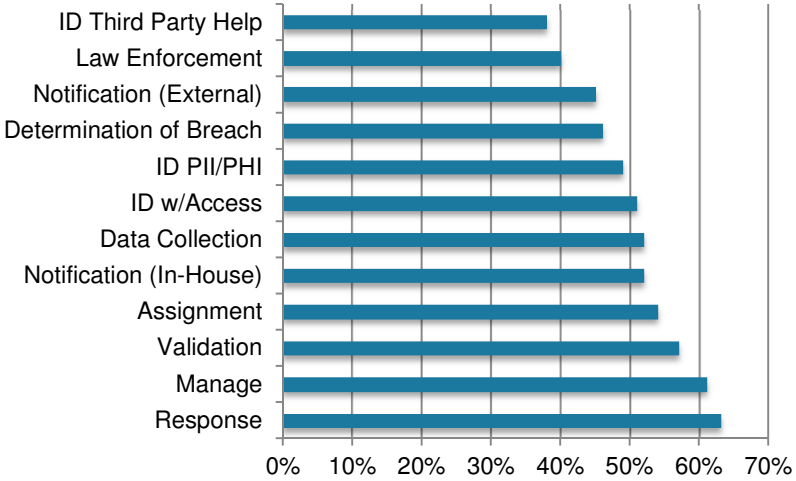


Make Preparedness A Priority

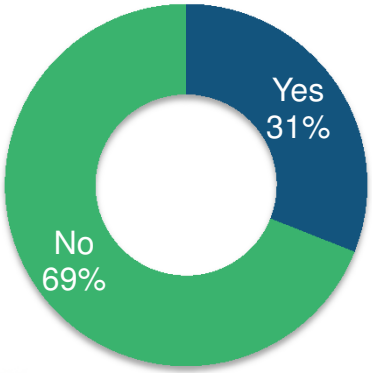
Preparedness for Addressing Data Breaches



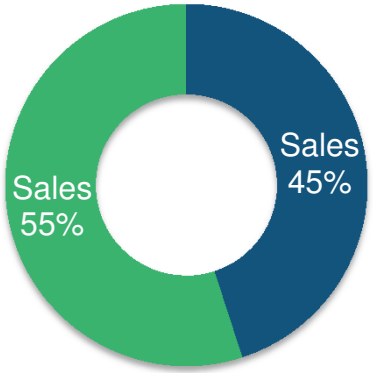
Processes for Managing Incidents



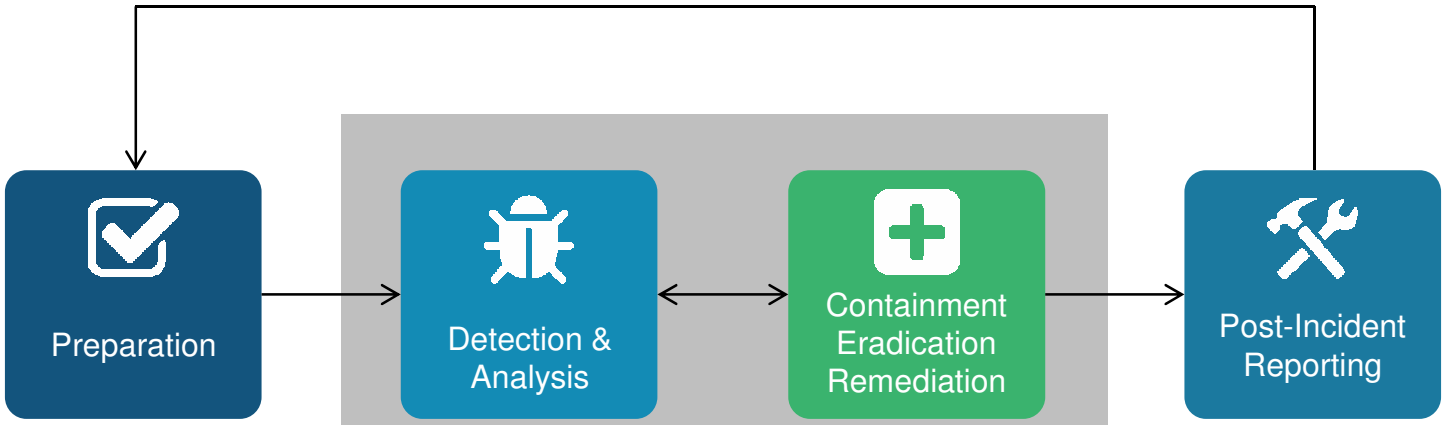
Data Breach Mitigation Budget



Data Breach/Cyber Insurance



Organization & Practice Are Critical



- Remove or reduce access
- Change all credentials
- Freeze changes
- Control access to physical and virtual backups
- Need current inventory

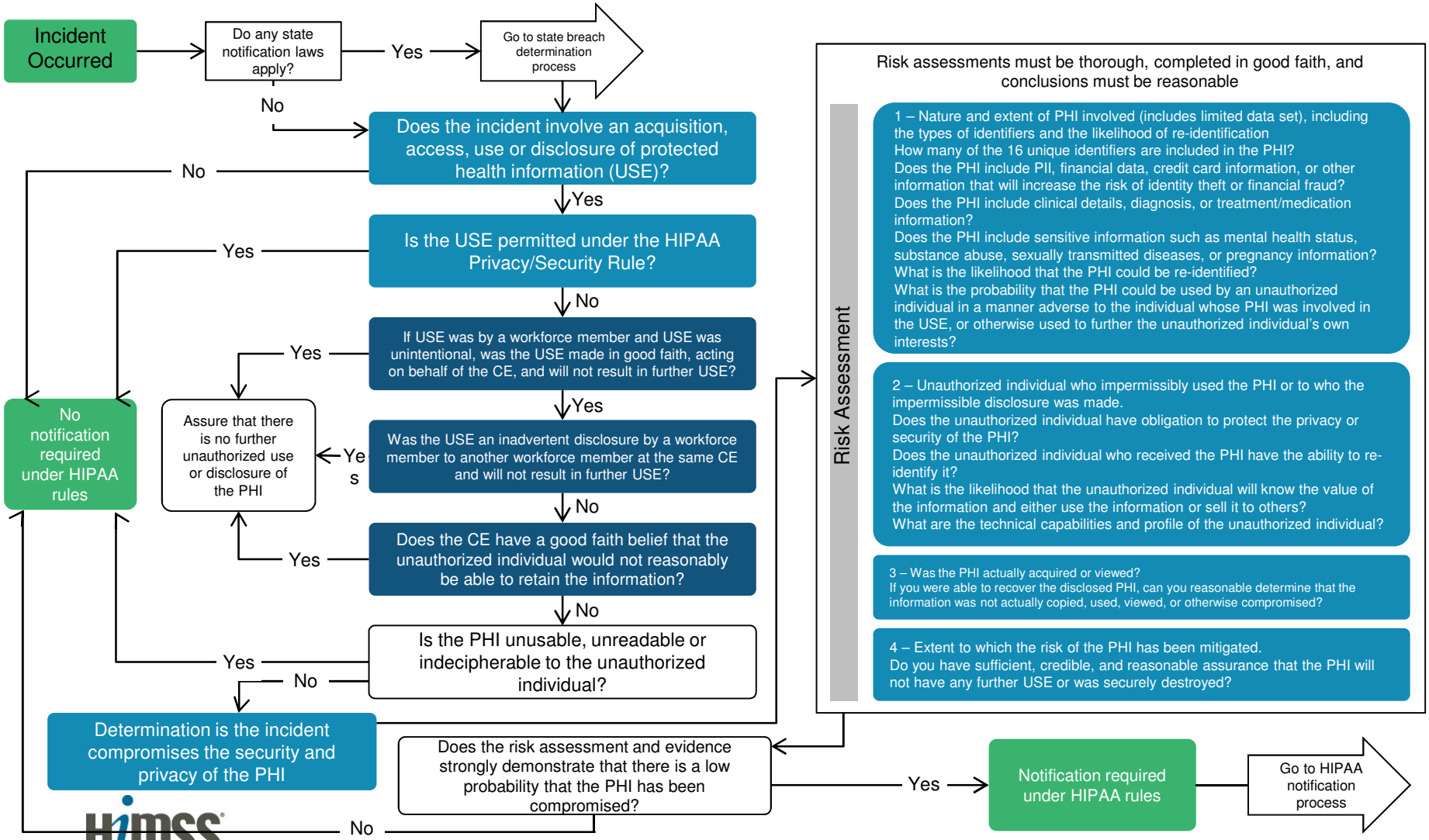
- Collect current system state of all assets for comparison
- Move collected data to secure location

- Collect reference masters for configurations
- If not – create known best practice state
- Compare the known good with current state

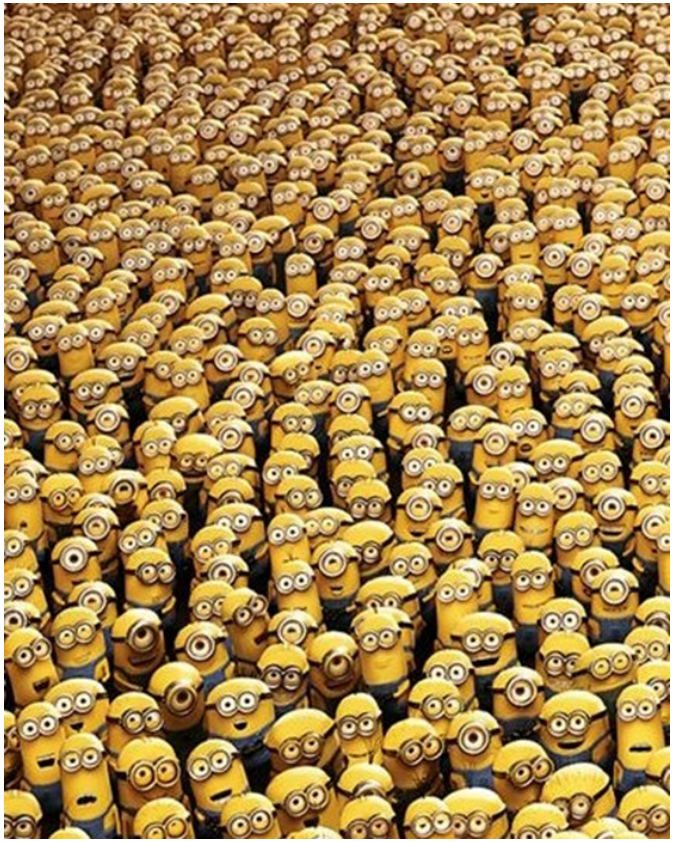
- Isolate/remove compromised systems
- Revise configs
- Redeploy
- Save copies of current state, log data
- Inform

> Life is about timing. – Carl Lewis
>
> So is breach mitigation – Mac McMillan

Discipline Yields Better Results



Enlist ALL of Your Security Team



- Training & awareness at all levels:
  - Workforce
  - IT Staff
  - IRM Members
  - Executives
  - Board
- New approaches that focus on interaction.

Governance and Support Are Crucial

- Majority of boards report that they do not understand cyber threats
- Many executives report that they just expect its covered
- Boards/execs are becoming more involved and interested in security
- They still want to know how it ties into the business

It’s Time for a Paradigm Shift

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What Can We Expect

- Social engineering attacks targeting people will continue increase (phishing, water cooler, social media) as hackers first option
- IoT will provide basis for attacks on attached devices of all kinds
- Ransomware will continue to be successful in targeting healthcare
- Medical device and wearable hacks will surface soon
- Growth in cybercrime-as-a-service make attacks viable for less sophisticated actors

Resources for Getting Started

- HealthIT.gov Guide to Privacy and Security of Electronic Information (v2.0, April 2015)
  - http://www.healthit.gov/sites/default/files/pdf/privacy/privacy-and-security-guide.pdf
- FTC start with security program
  - https://www.ftc.gov/tips-advice/business-center/guidance/start-security-guide-business
- Critical security controls project
  - https://www.sans.org/critical-security-controls/
- NIST Cybersecurity Framework
  - http://www.nist.gov/cyberframework/
- Poster series
  - http://www.ncsc.gov/publications/pii/index.html
- Protecting your personal information awareness videos
  - http://www.dni.gov/index.php/resources/protecting-personal-information

Questions


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