Data Security Basics: Helping You Protect You

Why the Focus on Data Security?

- Because ignoring it can get you:
  - Fined
  - Fired
  - Criminally Prosecuted
- It can also impact your ability to get future funding, and dramatically delay your work

Course Goals

- To better understand why data security is so important to the University, to the School, and to you
- To inform you of the data security policies that regulate our work at Columbia
- To share which data must be protected, and to provide some information about tools to help you do so
- **Help you protect yourself and your life's work**

What is Data?

- Dictionary.com says it is “Facts and statistics collected together for reference or analysis.”

- The data can be gathered for any number of purposes – business, research, education, etc.
  - When it comes to data security, the “why” is irrelevant. We care about the what:
    - Business and intellectual data, processes, resources, clinical and genetic data, demographic data, financial data, etc.

What Data Are We Worried About Protecting?

- All data is not equal. We're worried about what is generally termed "sensitive data."
- Sensitive data typically falls into two categories -- PHI and PII.
  - PHI: Protected Health Information
  - PII: Personally Identifiable Data

Why Are We So Concerned?

- Use of PHI and PII is regulated by both the State and Federal Government via the following:
  - NY State SSN Breach Act (2004)
  - HIPAA Privacy (2003) and Security (2006)
  - HITECH (2009)

- As of the adoption of HITECH, institutions that leak "sensitive data" are subject to significant penalties. Medical institutions, such as CUMC, are subject to ENORMOUS penalties: Monetary fines, costly investigations, and potentially **criminal prosecution**

But I don't Have Any "Sensitive Data!"

- The most common comment from faculty and staff about data security is "it doesn't apply to me. I don't deal with sensitive data." But it does apply.

- As part of the CUMC Community, the Mailman School uses the same network as the hospital. Our data travels on the same pipe, and our colleagues do have sensitive data. A hole in security at Mailman is a hole in security at the hospital

Why Should *You* Worry?

- At CUMC, the penalties flow down hill.
  - According to CUMC's "Guidelines for Sanctioning Violations of Policy on Unauthorized Access, Use or Disclosure of PHI/PII" (Dec '12) can result in:
    - Fines as high as $75,000 or more *per incident* for the department responsible
    - Termination/Non-Renewal of the noncompliant faculty/staff member
    - Criminal prosecution of faculty/staff
- The government (OCR), and therefore CUMC, is serious about going after offenders

Security Headlines

Facebook admitted that it was breached
February 15, 2013
Two weeks after Twitter made a similar admission (250k users)

Living Social breached, customer information accessed
April 27, 2013
70 Million Users passwords have been accessed

Anonymous posts 4000 US Bank Executive credentials
February 5, 2013
Followed up by a breach of the Federal Reserve

Hackers breach 53 Unis and Dump Personal Records
October 3, 2012
Personal records were published from Harvard, Stanford, Cornell, Columbia, Princeton, Johns Hopkins

Washington Post a victim of Chinese Cyber attacks
February 1, 2013
Tip of the iceberg, More than 100 countries are involved in cyber espionage.

The Wall Street Journal Hacked by the Chinese
January 31, 2013
News Corp described the attack as an "ongoing issue"

Two million passwords hacked by keylogger virus
December 4, 2013
Facebook, Gmail, Yahoo, Linked In, ADP

Hackers in China Attacked the NY Times for 4 months
January 30, 2013
Infiltrated their systems & stole passwords of all their employees.

US hacking attacks according to GAO:
in 2006? **5,500** in 2012? **48,500**
(9x increase)

In 2008, there was $1 Trillion worth of Intellectual Property stolen due to hackers

Universities Facing Intrusions (2013 – 2014??)

Stanford University hacked twice - Users changed passwords May & July 13

University of Delaware hacked 72K of PII stolen **$19M cost estimate** July'13

Virginia Tech 145K job applications stolen; 16K w/DL info Sept. 13

Brandon University PII stolen from Student Admissions Applications Oct. 13

John Hopkins University – 850 PII records stolen March, 2014

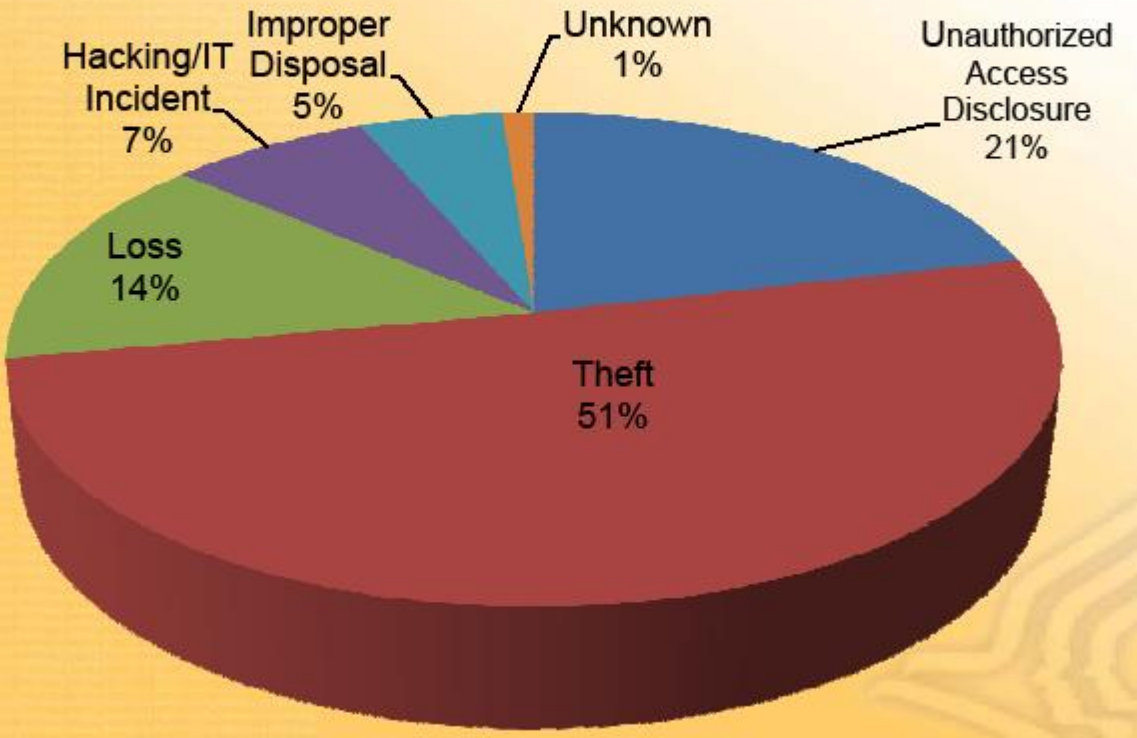
Boston University Direct Deposits diverted Jan, 2014

University of Maryland 300K PII records stolen Feb, 2014

University of Indiana 146K PII records stolen Feb, 2014

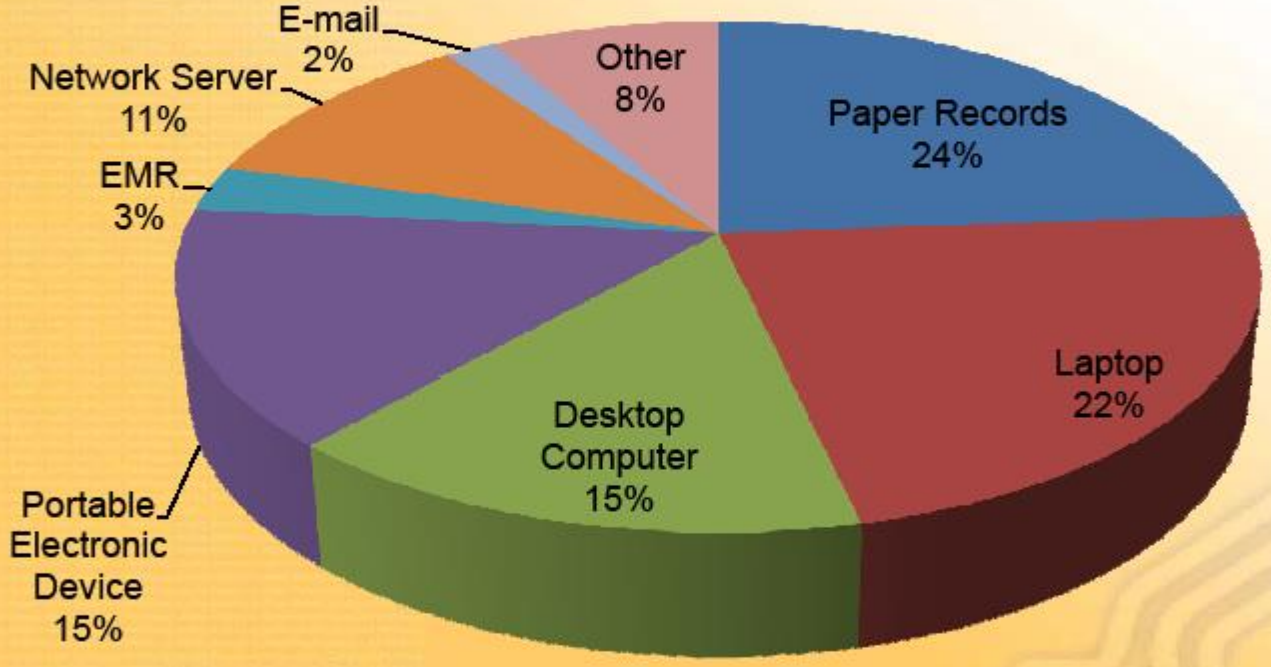
University of North Dakota 300K PII records stolen March, 2014

Breach Notification:
500+ Breaches by Type of Breach



OCR

Breach Notification:
500+ Breaches by Location of Breach



How Do You Protect Yourself?

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Know Your Weak Spots

- There are four main areas of vulnerability:
  - Software: Whether it's a custom application or off the shelf
  - Hardware: Configuration and maintenance issues
  - Environmental: Physical security of equipment
  - You and Your Colleagues: Weak passwords, password sharing, poorly maintained desktops/laptops, downloading "iffy/bad" software, falling for scams

Know and Abide by Our Policies

- There are three policy tiers that govern our work for the School:
  - The University Administrative Policy Library section "Computing & Technology"
  - CUMC's "IT Policies, Procedures and Guidelines"
  - Mailman School's Key Guidelines & Policies
  - CUMC's System Certification Requirement: All servers and custom software applications need to be registered with CUMC IT Security to be certified "secure" prior to being allowed on the network
- Links to all can be found in *Policy Central* on the Mailman IT Website.

Use the *Principle of Least Privilege* in All Things

"That an individual, program or system process is not granted any more access privileges than are necessary to perform the task."

Make Use of Existing Secure Resources

- The Mailman School provides secure data storage via CUMC IT's file server at no charge:
  - O drives hold personal work data (1GB)
  - P drives hold project data accessible by one or many (Many GB)
- CUMC IT provides a Sharepoint server for secure project collaboration
- Use CU's secure *Connected* Back-up service
- If you need your own servers, outsource to a CUMC IT-certified secure server or host

…and Avoid Insecure Ones

- It is against policy to use third party e-mail providers, such s like Google, Hotmail, Yanoo, etc., for work
- Replace DropBox with Box for file sharing or better yet, get an SFTP account with CUMC IT
- Do not used any data storage resources that are not covered by a CUMC Business Associates Agreement (BAA) and certified “compliant” by CUMC IT Security

De-Indentify Your Sensitive Data

- HIPAA Privacy Rule:
  - "allows a covered entity to de-identify data by removing all 18 elements that could be used to identify the individual or the individual's relatives, employers, or household members..."

1. Names
2. All geographic subdivisions smaller than a state
3. All elements of dates (except year) for dates directly related to an individual
4. Telephone numbers
5. Facsimile numbers
6. Electronic mail addresses

Source: OCR, Courtesy of CUMC Security Presentation May '12

De-Indentify Your Sensitive Data (2)

7. Social security numbers
8. Medical record numbers
9. Health plan beneficiary numbers
10. Account numbers
11. Certificate/license numbers
12. Vehicle identifiers and serial numbers, including license plate numbers
13. Device identifiers and serial numbers
14. Web universal resource locators (URLs)
15. Internet protocol (IP) address numbers
16. Biometric identifiers, including fingerprints and voiceprints
17. Full-face photographic images and any comparable images
18. Any other unique identifying number, characteristic, or code, unless otherwise permitted by the Privacy Rule for re-identification

Encrypt, Encrypt, Encrypt

- "Encryption is the process of encoding information so that only authorized parties can read it." (The Free Dictionary)
- Encryption is REQUIRED for all laptops and portable devices; desktop machines must be encrypted if they hold sensitive data
- CUMC-approved drive encryption software includes: Bitlocker with PBA and Filevault 2
  - You can use Bitlocker and Filevault to encrypt hard drives, USB drives, external hard drives, SD cards, etc.
  - Encryption keys should ALWAYS be stored in your O drive – that way it is secure, but you can access it from anywhere, anytime

Encrypt, Encrypt, Encrypt (2)

- Encrypt documents using Winzip for PC or Mac, or via password protection built right into MS Office.

- Encrypt sensitive e-mail by typing “#encrypt” in the subject line before your actual subject text.
  - http://www.cumc.columbia.edu/it/howto/encrypt/secure-email.html

Keep a Clean “House”

- Don’t keep data around that you don’t need
  - Wipe old data from computer hard drives you want to dispose of or repurpose -- ask your Mailman Tech for aid
  - Destroy old media before discarding it (Cds, Dvds, back-up tapes, USBs). The School has media shredders at ARB and 600 buildings for this purpose
  - Delete old e-mail; back-up critical e-mail to the P drive
  - Keep all the data you DO need on the P or O drives, not locally on your machine or portable devices
  - Consider ALL your data, not just the data you’ve collected while at Mailman

Use Sound Computing Practices

- Highlights
  - Use strong passwords for all of your logins and change them at least every 90 days
    - A strong password is at least 8 characters long and a combination of upper and lowercase letters, numbers and symbols
  - Make sure you have virus/malware protection on your computer with auto update enabled
  - Activate your OS' native firewall
  - Enable a locking screensaver (w/strong password requirement) that runs after 15 minutes of inactivity
  - Never share your passwords or leave them lying near your computer

Educate Yourself

- Administrators/owners of applications and servers that access or contain sensitive data must take technical data security training. Visit the *Data Security & Me* section of the Mailman IT Website for details.

- Attend CUMC's annual HIPAA/HITECH presentation. It is announced by e-mail. You can also watch the latest one online at the Mailman IT site.

Budget for Data Security

- If your project requires a server or custom software application, provide the appropriate resources to support it:
  - **Hardware:** Use trained system administrators and computer technicians to support your equipment; Insist on device “hardening” and patching/maintenance
  - **Environmental:** House your equipment in compliant data centers
  - **Data Collection and Management**: Hire data experts who know how to gather, store, analyze, and archive your sensitive data

Budget for Data Security (2)

  - Software: Hire knowledgeable programmers who code to official data security standards

- You are ultimately going to pay anyway, either to build and maintain the system properly at the beginning, or to fix the system after it is assessed by CUMC IT Security. It is MUCH cheaper and faster to build it correctly than to repair it!

Who can help?

- Your Mailman IT Tech
- The central Mailman IT Office
  - Data security audit support
  - Certified vendor list
  - Encryption, etc.
- CUMC IT Security

Questions?

HITECH Act (ARRA)

- **HITECH Breach Notification Law – Effective Sept 2009**
  - *Applies to all electronic **"unsecured PHI"***
  - *Requires immediate notification to the Federal Government if more than 500 individuals effected*
  - *Annual notification if less that 500 individuals effected*
  - *Requires notification to a major media outlet*
  - *Breach will be listed on a public website*
  - *Requires individual notification to patients*

- ***Criminal penalties*** ***-*** *apply to* **individual** *or employee of a covered entity*