

Security Plans for Restricted-Use Data

Below are different locations where you might choose to store the Add Health data.

- Please make your selection.
- Then read the associated document “How to secure ...” to see the essential components of a good security plan for that analysis/storage location.

Submit the completed *Attachment A: Form to Describe Sensitive Data Security Plan* for your analysis/storage location.

Find Security Plan forms [here*](#) on the CPC Data Portal (scroll down the page until you see “Forms”).

Server plan: Please email addhealth_contracts@unc.edu for the current form.

If your analysis/storage location is not listed, or if you need assistance with the security plan:

- Please email addhealth_contracts@unc.edu.
- It is recommended that you ask for a consult with our security administrator prior to spending a large amount of time working through your local institution’s security office and IRB.

Option 1: Data stored on an Encrypted Stand-Alone Desktop Computer

A stand-alone computer is one that is in no way connected to another computer or networked device such as a switch, hub, or router.

Information on how to secure a stand-alone computer is available in this document at [How to secure a stand-alone desktop computer](#).

Option 2: Data stored on an Encrypted External Hard Drive

The external hard drive is a modified version of the stand-alone computer, in effect keeping the AddHealth data off the Internet or a local area network (LAN), while using your daily-use computer.

Information on how to secure an external hard drive is available in this document at [How to secure an external hard drive](#)

Option 3: Data stored on a Remote Compute Server

- Files are stored on the server.
- All processing of the data files is done on the server.
- Data files are not served to the user's computer over the network.

Information on how to secure a remote compute server is available in this document at [How to secure a server](#)

How to Secure a Stand-Alone Desktop Computer

A stand-alone desktop computer is one that is in no way connected to another computer or networked device, such as a switch, hub, or router (with the possible exception of a direct-connected printer), or to the Internet or a local area network (LAN).

- The stand-alone desktop computer can be running Windows 10/11 client, Windows server, Linux, or Mac OS X.
- Because the stand-alone desktop computer is not connected to the Internet or a local or wide area network, the emphasis for securing the data is placed on physical security of the computer and controlling access to the data.

Here are the minimum steps you should take to secure the Add Health data on your stand-alone desktop computer:

Physical Security of a Stand-Alone Computer

1. Configure the BIOS to boot the desktop computer from the hard drive only.
Do not allow the stand-alone desktop computer to be booted from a CD-ROM drive, a USB flash drive, or an external hard drive.
2. Password protect the BIOS so changes cannot be made to the BIOS without authorization.
3. Secure the desktop computer on which the Add Health data resides in a locked room, or secure the desktop computer to a table with a lock and cable (locking the case so the battery cannot be disconnected, which would disable the BIOS password).
4. Remove or disable the network interface card (NIC) so it cannot be used.
5. Store the data on a desktop computer only. *Laptops may not be used to store the Add Health data.*

Controlling Access to the Data

1. Restrict access to the Add Health data to project personnel using the security features available via the operating system (e.g., login via userid/password and NTFS permissions in Windows, ACLs in Linux, and OS X).
2. Require [strong passwords](#).
 - You can [enable password complexity](#).
3. Password protect screen saver and activate after seven minutes of inactivity.
4. Enable whole disk encryption (e.g., *Bitlocker*, *PGP Whole Disk Encryption*, *FileVault2*, *VeraCrypt*).
5. If you are putting the Add Health data on a secondary internal hard drive, configure your analysis software to [point temporary work files](#) to the secondary encrypted Add Health data directory.
6. Install and periodically run a secure erasure program.
 - This program should be run monthly and after the secure data has been removed from the computer at the end of the contract period.
 - (*Heidi is free and works well*. [SDELETE](#) also works well and can be scripted.)
7. Do not copy or move the Add Health data out of the secured directory for any reason.

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How to Secure an External Hard Drive (EHD)

An external hard drive is a modified version of the [stand-alone computer](#), in effect keeping the Add Health data off the Internet or a LAN, even though you may be using your main computer that is normally connected to the internet.

- The emphasis for securing the data on an EHD is placed on removing the computer from the network while the EHD is in use, controlling access to the data directory, and physically securing the EHD in a locked cabinet when not in use.
- For one to three users who are willing to schedule time accessing the data, this option can be one of the most secure computing platforms for your sensitive data.
- USB "thumb/jump" drives are not acceptable devices for this option.
- USB external hard drives, Firewire external hard drives, or EIDE hard drives in a Startech-type of removable device are acceptable options.
- The EHD must be larger than purse or pocket size. This type of EHD is sometimes classified as a desktop model and must be plugged into an electrical outlet when in use.
- Use of a laptop with the EHD is permitted; however, the laptop must be encrypted and the temp files must be redirected to the EHD.

To make this scenario work, you need remember and do only two things:

1. Never have the network cable and EHD connected to the computer at the same time.
2. Always secure the EHD in a locked cabinet, drawer, or safe when not in use.

Prerequisites for placing the Add Health data on an EHD:

1. You need a private, lockable office, not a student computer lab.
2. You need your statistical analysis applications installed on your local hard drive (i.e., your computer), not on a network server.
3. You may need a new local userid on your PC, since you may not be able to use your Domain Account, unless you are able to login without an internet connection (e.g., credentials are cached).
4. You must use an operating system that is currently being patched and supported by the vendor (e.g., Windows 10/11, Mac OS X, or Linux). You may not use Windows 95, 98, NT4, XP, 7, or 8.

If you are unsure whether or not your operating system is currently supported, do an internet search on your operating system with the word "lifecycle." This should give you the vendor's timeline for supporting the operating system.

For example, searching "Windows Lifecycle" shows the [Microsoftpage](#) detailing the years during which their operating systems will be supported.

Searching "Mac OS lifecycle" shows <https://endoflife.date/macOS>.

5. You must not move the EHD from the location specified in your security plan (e.g., cannot move between office and home).

Follow these steps to prepare your computer for use with the Add Health data on an EHD:

1. Power down the computer, which resides in a locked room accessible by authorized personnel only.
2. Disconnect the network cable.
3. Connect the EHD.
4. Power up the computer.
5. Login using the local userid (or the cached Domain account) created for accessing the Add Health data.
6. Create separate directories on the EHD for the Add Health data and your program files (i.e., do not store the Add Health data in the same directory as you use for your program files).
7. Encrypt the entire local computer's hard drive as well as the EHD with either Bitlocker, PGP Whole Disk Encryption, VeraCrypt, or another whole disk encryption program.
8. Configure your analysis software to [point temporary work files](#) to the encrypted Add Health data directory on the external hard drive.
9. Password-protect your screen saver and activate after seven minutes of inactivity.
10. Install and periodically run a secure erasure program.

This program should be run monthly and after the secure data has been removed from the computer at the end of the contract period.

(*Heidi is free and works well.* [SDELETE](#) also works well and can be scripted.)

Follow these steps each time you use the Add Health data EHD:

11. Power down the computer.
12. Disconnect the network cable. (Creating a hardware profile that disables the network interface card is an acceptable substitute for disconnecting the network cable.)
13. Connect the EHD.
14. Power up the computer.
15. Login using your local userid (or the cached Domain account).
16. Do not leave your computer and EHD unattended.
17. Do not copy or move the Add Health data out of the secured directory on the EHD for any reason.

Follow these steps when you are not using the Add Health data EHD:

18. Logout.
19. Power down the computer.
20. Disconnect the EHD.
21. Lock the EHD in the approved secure place (e.g., a file cabinet, drawer, or safe).
22. Connect the network cable.
23. Power on the computer and login.

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How to Secure a Server

A server must be configured as a Compute Server.

- *Windows Terminal Server and Linux Compute Server*: A compute server stores and processes all files directly on the server – files do not cross the wire to the user's computer.
- The security benefit to using a compute server is that all of the sensitive files stay on the server.
- However, the compute server environment typically requires higher-end servers with more processing power and memory to accommodate a large number of users.
- While we still need to evaluate the security posture of the user's computer, the main emphasis for securing data on a compute server is securing the compute server and the communication tunnel between the server and the user's computer.

The security plan form contains two tables of security controls: one for the server and one for the user's local computer. The link below offers an explanation of the security controls for both the server and workstation:

- [Explanation of Security Controls Standards referenced in "Form to describe your security plan"](#)

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Choose a Good Password

A good password SHOULD

- be at least 16 characters in length
- use at least one non-alphanumeric character. These are: ~!@#%&*()_+={}|[]\:"';<>?,./`
- use at least one numeric character (0-9)
- use a mix of upper- and lower-case letters
- be very different from the last password used for that account (at least four characters not used in the previous one)
- A passphrase is best. Think “longer is stronger.”

A good password SHOULD NOT

- include any personal information about you (e.g., nicknames, initials, login name, SSN#, address, birthday)
- include any personal information about your relatives
- include any information about your work (e.g., office number, project name)
- be the name of any computer (e.g., Dell, Unix)
- be written down anywhere or in any file on any of your accounts
- see www.xkcd.com/936

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Redirect Temporary Work Files

- Statistical applications will create temporary data sets during the execution of your programs. The location of these temporary working directories can be specified for each statistical application. You should configure your statistical analysis software to point the temporary work files to an encrypted temporary data directory (i.e., e:\tmpDATA) to ensure portions of your data set are not accessible by unauthorized individuals. You should then run the secure erasure program on this temporary data directory periodically.

Following are some popular statistical applications and directions for redirecting the temporary working directories.

MPlus

- To set MPlus to use a secured directory for temporary files, create the FORT_TMPDIR environment variable and assign it the name of the secured directory.

R

- Environment variables can be set for Rgui.exe and Rterm.exe in three different ways. See the following URL for instructions.
 - https://cran.r-project.org/bin/windows/base/rw-FAQ.html#How-do-I-set-environment-variables_003f

SAS

- Add the following to the end of the "Target/Command" line in the properties of the SAS shortcut: -work "drive_letter:\secure_directory" (i.e.: -work "e:\ahd\tmpSAS").

SPSS

- In SPSS you need to manually set the temporary working directory. This is done under *Edit, Options, Temporary Directory*.

Stata

- To point temporary Stata files to a secured directory, you need to set an environment variable called STATATMP and point it to the secured directory (i.e., e:\ahd\tmpSTATA).
- See <http://www.stata.com/support/faqs/data/statatmp.html> for more details.

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Links to Security Resources

The following web sites are listed here for your reference. Reading these pages is not mandatory for securing your computer for the Add Health data, but may provide more detailed information than the pages listed under "How to Secure...".

General Guides

- [SANS/FBI Top 20 List](#)
- [SANS Security Step-by-Step Guides](#)
- NSA security guides: <https://www.nsa.gov/Press-Room/Telework-and-Mobile-Security-Guidance/>
- [Internet Connection Security for Windows Users](#) by Gibson Research Corporation
- [CERT](#)
- [SecurityFocus](#)
- [Common Vulnerabilities and Exposures](#)
- [The Center for Internet Security](#)
- [Microsoft Security](#)

Unix Security

- [General Linux Security](#)
- [Suse Linux](#)
- [Red Hat Security Guide](#)

Windows Security

- [Microsoft Security Documentation](#)

Macintosh Security

- [Apple Computer's Security Updates](#) (Search for "Security Updates")

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