

Feature	Excel®	Access®	REDCap™
Summary	Excel is a convenient spreadsheet tool, used for storing, organizing, manipulating, and visualizing data. However, it lacks features important to support data collection and management in health research, making it an inappropriate tool.	Access is a sophisticated data management tool. However, it is not HIA-compliant, database development often requires programming assistance, and consequently has a larger support footprint. For projects with complex data collection requirements, Access may be a suitable option.	REDCap is a secure, web-based, application designed to capture and store health research data. It is HIA-compliant, compatible with several statistics packages, and easy to use. REDCap is designed to export data for analysis and reporting, and therefore does not include these capabilities.
HIA			
Secure location -health information resides on a secure server	Only if the file resides on a secure server, not on a PC	Only if the file resides on a secure server, not on a PC	Yes. REDCap resides on the FoMD's secure server and is accessed via the internet
Encrypted -data files accessed without proper authentication cannot be read	Manual encryption of file possible	Manual encryption of file possible	Project data cannot be accessed without authentication Auto-encryption available (not enabled at this time)
Authentication -logins and passwords	No	No	Yes
Authorization -role-based security	Access to data can be set by file owner with installation of MS Information Rights Manager PlugIn for Office 2007	Access to data can be set by file owner with installation of MS Information Rights Manager PlugIn for Office 2007	Yes. User accounts are controlled by the REDCap Administrator; access to individual databases is controlled by the owner of the database
Audit Trail -created by event logging	No	No	Yes. REDCap logs every database change, creating a comprehensive audit trail
Managing Data			
Creation of metadata	No	Yes	Yes
Data validation	No	Yes (Requires programming effort)	Yes (Automatically configured, no programming required. Includes sophisticated data quality tools)
Attaching documents	No	Yes	Yes
Vulnerabilities	Easy to corrupt or lose data	Easy to corrupt data if not programmed correctly	Limited flexibility in form design
Layout in form view for easy data entry	No	Yes	Yes
Multiple user access to data	No	Record-level locking	Yes, but no locking; last save overwrites previous save
Data Storage			

Flat vs. relational data	Flat	Relational	Flat (Internally relational, flat output)
Unique identifiers	No	Yes	Yes
File size limitations	255 columns	Very Large	Scalable, based on server size
Data Import and Export			
Importing data	Comma-separated values (CSV)	Open Database Connectivity (ODBC) compliant	CSV / Excel
Exporting data	CSV	ODBC compliant	CSV/Excel, SAS, SPSS, Stata, R (export tool creates syntax files)
Use of Forms and Reports			
Create and use forms	No	Custom	Standard
Export forms	N/A	PDF	PDF / Excel data dictionary
Query data			
Sort and filter data	Moderate	Strong	Very Simple
Create different views and complex queries	None	Strong	None
Data Analysis & Visualization			
Graphing data	Strong	None	Simple graphical view and summary statistics
Calculations	Strong	Moderate	Limited
Convenience			
Remote access	No	No	Yes-web-based
Offline data collection	Yes	Yes	No
Portable device compatible	No	No	Yes
Programming assistance required	No-generally easy to set up, familiar to most people	Setup is complex and may require programming assistance and ongoing support	No-very easy to setup and use
Layout in form view for easy data entry	No	Yes	Yes
Other			
Secure file transmission	No	No	Yes, using Send-It feature
Support for double data entry	Limited	Can be programmed	Built-in
Assistance available	No	No	Yes
Cost	Free	Free, but may require programming fees	Free to University of Alberta members

Adapted from: Colorado Clinical and Translational Sciences Institute (<http://cctsi.ucdenver.edu/RIIC/Documents/Data-Management-Tool-Comparison.pdf>)