Data Management and Research Electronic Data Capture (REDCap) Training using Educational Program to Increase Colorectal Cancer Screening (EPICS) data

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ABSTRACT

The Institute of Public and Preventive Health (IPPH) Summer Scholars Research Program (SSRP) was developed to train students in the different disciplines of Public Health. One of the goals of the 2015 SSRP was to train participatory scholars in the use of Research Electronic Data Capture (REDCap) for the capturing and management of research data. The Educational Program to Increase Colorectal Cancer Screening (EPICS) data was used for this purpose.
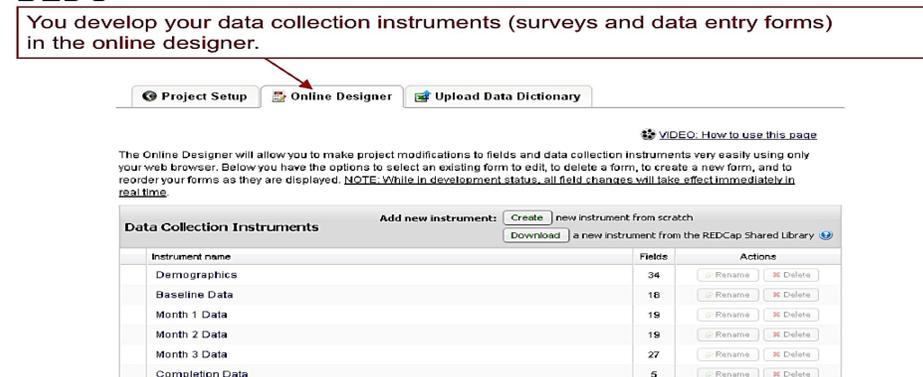
BACKGROUND

- One of the objectives of the 2015 Institute of Public and Preventive Health (IPPH) Summer Scholars Research Program (SSRP) is to train scholars in the use of Research Electronic Data Capture (REDCap) for acquiring and managing research data.

- REDCap is a secure, web-based application used to build and manage online surveys and databases.
  - Developed at Vanderbilt University in 2004 and launched its consortium to share with other universities in 2006.
  - Clinical and translational science researchers/teachers use REDCap extensively.

- Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the second leading cause of death in the United States.
  - The American Cancer Society estimates that over 132,700 people will be diagnosed with CRC and over 49,700 people will die from this disease in 2015.

- The Educational Program to Increase Colorectal Cancer Screening (EPICS) is an intervention to increase CRC screening among African Americans.
  - EPICS has a total of 15 coalitions in the United States and one of their functions is to administer survey instruments to study participants.
  - Community coalitions serve as clusters as a part of the National Black Leadership Initiative on Cancer, a network that was founded in 1987 and have primarily engaged in community education efforts.
  - The coalitions include individuals from academia, business, health care, non-profit organizations, and other community stakeholders.
  - Data from these coalitions are entered into REDCap for storage and management.

- RedCap can be used also for analyzing inputted data.

- The expectations of the 2015 IPPH SSRP include:
  1. To learn how to build online surveys and databases
  2. To learn how to save data collection instruments
  3. To be familiar with data entry and data cleaning
  4. To be able to export data to common data analysis packages
  5. To review literature and to draft summaries of literature with citation for publications
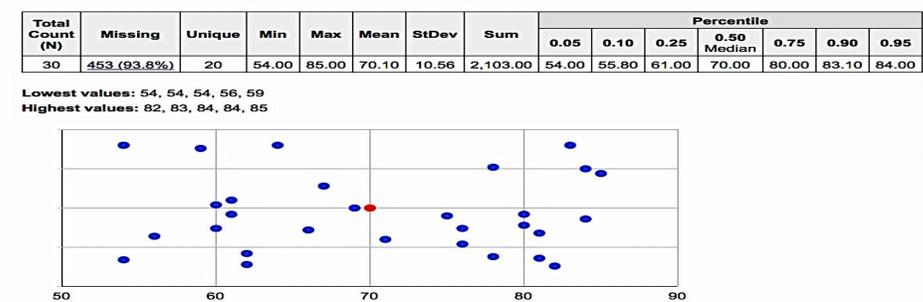 6. To submit weekly updates

METHODS

- REDCap functionalities include validation of data types, range checks for numbers and dates, branching logic to hide fields until appropriate based in other fields, and calculated fields.
- REDCap's streamlined process allows projects to be created and designed using 1) the online method from a web browser using the Online Designer; and/or 2) the offline method by constructing a 'data dictionary' template file in Microsoft Excel, which can be later uploaded into REDCap.
- Both surveys and databases (or a mixture of the two) can be built using these methods.
- REDCap provides audit trails for tracking data manipulation and user activity, as well as automated export procedures for seamless data downloads to Excel, PDF, and common statistical packages (SPSS, SAS, Stata, R).
- Also included are a built-in project calendar, a scheduling module, ad hoc reporting tools, and advanced features, such as branching logic, file uploading, and calculated fields.
- REDCap has a quick and easy software installation process, so that you can get it running and fully functional in a matter of minutes.

Figure 1: Snapshot of how to create data collection instruments in REDCap

RESULTS

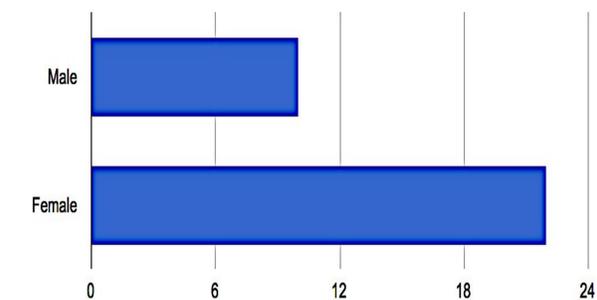**Figure 2**: Creating a report in REDCap using EPICS session 2 age data

Age:

Total Count (N)	Missing	Unique	Min	Max	Mean	StDev	Sum	Percentile						
								0.05	0.10	0.25	0.50 Median	0.75	0.90	0.95
30	453 (93.8%)	20	54.00	85.00	70.10	10.56	2,103.00	54.00	55.80	61.00	70.00	80.00	83.10	84.00

Lowest values: 54, 54, 54, 56, 59
Highest values: 82, 83, 84, 84, 85

RESULTS

Figure 3: Creating a report in REDCap using EPICS session 2 gender data

Gender:

Total Count (N)	Missing	Unique
32	451 (93.4%)	2

Counts/frequency: Male (10, 31.3%), Female (22, 68.8%)

DISCUSSION/CONCLUSIONS

Major advantages of the REDCap system include:
1. the ease of form construction.
2. a point and click web interface for creating forms.
3. the possibility to create and upload data dictionaries that are externally constructed in Excel.
4. used to produce customized reports and for exporting the data.
5. the ability to export data from REDCap can be done in multiple formats for use in other statistical programs.
6. user privileges can be assigned and regulated by the REDCap system.

REFERENCES

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