

Supported Learning Sessions on REDCap in Recife/PE, Brazil: setup and results

Cristiane Campello Bresani Salvi, Larissa Pruner Marques, Flávia Thedim Costa Bueno

Oswaldo Cruz Foundation – Fiocruz, The Global Health Network Latin America and the Caribbean

The Supported Learning Sessions (Spanish: sesiones de aprendizaje asistido; Portuguese: sessões híbridas de aprendizagem; French: séances d'apprentissage accompagnées) aim to provide resources, access and additional guidance to participants in order to navigate and complete the e-learning training modules or other online resources. This program adopts a blended learning methodology that combines synchronous lectures (either in-person or online) with the completion of asynchronous e-learning courses or toolkits offered by the TGHN training centre or partner e-learning platforms. Upon successfully finishing the predetermined number of sessions, participants are required to undergo an evaluation process to obtain certification.

This approach entails a more immersive and comprehensive educational experience centred on a specific topic, which is guided by a tutor. It offers a wealth of supplementary materials and resources, including documents, recorded lectures, e-learning courses, online materials, group exercises, tutorials, and more. Additionally, it incorporates live interactions with the tutor who aids in clarifying concepts, monitoring progress, and providing valuable feedback to participants. The following text provides the experience on setting Supported Learning Sessions (SLS) on the software REDCap (Research Electronic Data Capture) and the main outcomes, in a research centre in Recife, at Northeast of Brazil, from November 2023 to January 2024.

FIRST STEP: A focal gap

The first step to setup a SLS is to identify what is the gap that needs to be addressed and if SLS is the most suitable strategy. In this reported experience, a researcher with practical experience on clinical research had identified a critical gap in her local research ecosystem, which she could address as a tutor conducting SLS.

The gap was a few knowledge and adoption of softwares to efficiently collect, store and manage data in the institution she belongs, Aggeu Magalhães Institute (IAM). IAM is an unit of the Oswaldo Cruz Foundation (Fiocruz), the governmental research institution for public health of Brazilian Ministry of Health. In spite the IAM already had access to the REDCap since 2018, throughout local and central licences, data remain frequently being collected in physical case report forms or unsuitable digital programs, particularly in local or national projects, that are not sponsored by the big pharma or international funders. And so, using REDCap, a friendly digital platform for collecting, managing and sharing research data, would be beneficial for researchers.

SECOND STEP: Local resources

After the choice of the theme, an expert should be invited as a volunteer facilitator, as well as a suitable setting should be arranged, comprising computer stations and access to web. So, the tutor identified as facilitator a technician from the computer department, who works directly with the REDCap manager at IAM agreeded to collaborate free of charge.

Some arrangements among tutor and facilitator were settled regarding the sessions, such as the responsibility of each one throughout the planning, conduction and after sessions. The facilitator would be responsible to contact the REDCap manager and give theoretical and operational support on computing issues, and the tutor would stay in touch with the attendees, design, conduct the supported learning sessions and follow up on attendees. Eventually, both the tutor and the facilitator could run the sessions in one of the two classrooms with multiple computer workstations and free web access at IAM.

THIRD STEP: A learning program

As any capacity building strategy, a SLS needs a learning program, which must be prepared according to the aimed public and their level of knowledge, and should include the responsible team, learning objectives, target attendance, duration, content and support resources. To know the level of knowledge on REDCap among the researcher community of IAM, the tutor made an unformal survey in the WhatsApp group (multi-platform instant messaging and voice calling application for smartphones) of the Post Graduation Program in Public Health of IAM.

She received 21 answers from 40 professors and researchers. Only four of them reported having experience with REDCap, while 12 knew but never had used it and five had never heard about REDCap before. The REDCap is made up of tools that enable dynamic data collection and management through electronic forms, data import and export, the construction of reliable reports and the transfer of data to statistical analysis software. Its advantages include the use of research information between collaborators from different academic departments or institutions, under security and traceability.

Therefore, to encourage and enable the use of REDCap in research projects of Fiocruz Pernambuco, the tutor decided to build a training on instruments design in REDCap, namely *Customization of Instruments for Data Collection and Storage in REDCap - BASIC PRACTICAL TRAINING*. Given the very low experience of researchers on REDCap, the training aimed to introduce the REDCap Project and train basic and some intermediate designing features of the software. The SLS program was prepared besides The Global Health Network team at Fiocruz Rio de Janeiro ([see appendix 1](#)), and comprises a pre-sessions self-learning module, presential sessions and a post-sessions self-practices module. The lectures length was estimated to be one hour, plus one hour for supported practice, over three days of presential sessions. This scheme was based on the slides of the first three lectures of the REDCap Manual Course of the Fiocruz REDCap Community, on which the presential sessions were based: Lecture 1 – Introduction to Databank: fundamental concepts on databanks, their importance and applicability in research projects; Lecture 2 – Introduction to REDCap Platform and Basic

Features: its interface and basic tools to create forms and insert data; Lecture 3 – Practice and Intermediate Features: permission setups and data reports in REDCap (<https://cursos.campusvirtual.fiocruz.br/local/meucampus/courseinfo.php?id=1072>).

FOURTH STEP: Finding motivated learners

People with a knowledge gap doesn't always mean a motivated public. It is important to think about how the specific topic could bring interest and for whom. So, this experience shows that talking with different communities in your institution is critical to find out who currently would use the knowledge and who may think it promising for the future.

The tutor sent an unformal invite in WhatsApp group of the Post Graduation Program of Public Health of IAM, asking professors to indicate students or assistants potencialy interested on learning about REDCap. Class representative students of the post graduation program were also asked to share with colleagues, on their WhatsApp group, that a training on buiding research questionaries in REDCap would be offered soon, with the tutor contact details (mobile phone number and email address). Adicionally, some research support staff at Fiocruz Pernambuco were invited by the tutor, as during some work experiences she had identified interest on learning about REDCap. Finally, after a brief explanation on the learning goals, eleven students and research assistants made contact, and all of them, plus four out of five research support staff, decided to joining the sessions. Also, seven medical students who were in scientific initiation projects with the tutor were asked to attend the sessions, as part of their internship.

FIFTH STEP: Scheduling the sessions

Small groups facilitate scheduling the sessions, and some agenda options can be offered to encourage joining. The tutor established that, ideally, the number of attendants should not be greater than a digit, as she and the facilitator could give personalized support. She also decided to cluster attendants with a similar profile, so that learning could be directed to their needs.

Firstly, a WhatsApp group was created by the tutor, with the falicitator and 15 post-graduation students, research assistants and support staff who were interested. The tutor divided this group into two classes and presented them some possibilities of agendas. The tutor aimed to cluster the agenda in one week, so attendants could keep focus on the sessions, rather than other academic tasks. Both agendas should be adjusted as many times as needed to comprise all interested. Eventually, 12 interested were able to attend the SLS: seven in the 1st SLS offering (06, 07, 08 November 2023), and five in the 2nd SLS offering (11, 12, 13 December 2023). Then, the tutor created another WhatsApp group with her seven medical students of scientific initiation, and presented them some possibilities of agenda, adjusting it until to comprise their needs to attend the 3rd sessions offering (25, 26, 30 January 2024).

SIXTH STEP: Running the sessions

It is important to follow the SLS program and ensure that attendants know it before running sessions, as they can access the support resources and understand what, why and how they will learn. That is why the tutor shared the program at the WhatsApp group a week before, and asked for the attendants to watch the Module 4 of the Research in Clinical Practice 2021 Workshop at TGHN website (<https://rede.tghn.org/workshops2020/research-clinical-practice-2021>).

The Research in Clinical Practice 2021 Workshop was created as a capacity building online program to train the research team of a Brazilian multicenter case-control study, which should be conducted by the tutor during the pandemic's quarantines. Its Module 4 (REDCap: Tool for Data Collection and Management) introduces the importance and practical usefulness of the REDCap for clinical research.

The tutor asked the attendants to answer the pre-sessions survey till the day before the first presential lecture. For the presential lectures, the facilitator ensured that all the necessary technological conditions were in place, and he remained in the classroom, while the tutor was conducting it. The lectures had an interactive format, as the tutor went ahead on the topic while guiding the attendants through websites and REDCap software to show its basic and intermediate features and tools. For that, the tutor followed the first three step-by-step lectures of the REDCap Manual Course of the Fiocruz REDCap Community.

After an hour of interactive lecture, each session continued with an hour of practical learning, with tutor and facilitator giving support for each attendant to develop an own case report form on REDCap. For that, the tutor asked attendants to bring a case report form of their current research project, as they should transform it into a REDCap form. At the end of the third presential session, the tutor ordered the attendants to go ahead in their REDCap forms and kept available to give support on demand, presential or online, during the follow week. To evaluate the attendant's progression at the deadline of such self-practices post-sessions module, the tutor downloaded the attendant's REDCap forms and asked them to answer a post-sessions survey.

SEVENTH STEP: Evaluating and getting results

An evaluation of the SLS from the point of view of attendants is essential for improvements in the program and its format, as the aim of such a capacity building is to comply with the need of the interested public, rather than to impose necessary learnings. The attendant progress was measured by self-evaluation, which was performed with before-and-after REDCap surveys (see below the pre- and post-sessions surveys' questions in Table 1 and Table 2, respectively). The participants were asked to answer the pre-sessions survey prior to the first in person lecture, and the post-sessions survey max a week after they had finished the final assignment of their case report forms on REDCap.

Table 1. Self evaluation pre supported learning sessions.

Pre Sessions Survey's Questions

Email address:

Institution's name:

Which of the descriptions below best represents your role in the institution?

- 1, undergraduate student
- 2, postgraduate student
- 3, scholarship holder linked to a specific research project
- 4, technical/administrative support
- 5, researcher
- 6, other: please describe below _____

What's your role in research (or on your latest project)?

- 0, never worked in research
- 1, student on a scientific initiation programme
- 2, undergraduate student not in PIBIC programme
- 3, postgraduate student
- 4, research assistant or manager
- 5, sub-investigator
- 6, principal investigator

What is your highest degree?

- 0, incomplete degree
- 1, complete degree
- 2, complete master's degree
- 3, complete doctorate
- 4, post doctorate

Have you ever heard of REDCap?

- 1, Yes
- 2, No

Have you ever used REDCap?

- 1, Yes
- 2, No

Please indicate below how you rate your level of confidence with the following activities in REDCap: 1=not very confident; 2=confident; 3=very confident

DATA COLLECTION

1	<input checked="" type="checkbox"/>	2	3
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move the square above to choose your answer

REPORT EXTRACTION

1	<input checked="" type="checkbox"/>	2	3
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move the square above to choose your answer

DATA VALIDATION

1	<input checked="" type="checkbox"/>	2	3
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move the square above to choose your answer

QUESTIONNAIRE DEVELOPMENT

1	<input checked="" type="checkbox"/>	2	3
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move the square above to choose your answer

Do you give your consent for your answers to be used anonymously for research purposes?

- 1, Yes, I consent to my anonymised answers being used for research purposes.
- 2, No

The program had 19 attendants at all, amongst 16 responded to both pre- and post-sessions surveys. Two researchers from the first SLS offering didn't complete the surveys. Among the group of researchers (n 1), research assistants (n 3) and post-graduation students (n 5), two had never heard about REDCap, and only a research assistant had already used it. Only two medical students (n 7) had heard about REDCap, and no one had used it before the SLS.

Table 2. Self evaluation post supported learning sessions.

<u>Post Sessions Survey's Questions</u>																
Email address:																
Do you think the amount of content covered in the course was adequate? 1, Yes, I thought the amount of content was adequate 2, No, I thought the amount of content was excessive 3, No, I thought the amount of content was insufficient																
Do you think the level of difficulty of the content covered in the course was adequate? 1, Yes, I thought the level of difficulty of the content to be adequate 2, No, I thought the content difficult for me 3, No, the content was easy for me																
Did you find the duration of the course adequate? 1, Yes, I thought the duration was adequate for what was proposed 2, No, I found it long for what was proposed 3, No, I found it short for what was proposed																
Are you interested in learning more about REDCap? 1, Yes 2, No																
Would you like to incorporate REDCap into your work routine? 1, Yes 2, No																
How likely are you to incorporate REDCap into your work routine? 1, Unlikely 2, Likely 3, Very likely																
Would you like to provide some feedback on the training so that we can improve it?																
Please indicate below how you rate your level of confidence with the following activities in REDCap: 1=not very confident; 2=confident; 3=very confident DATA COLLECTION <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>3</td> </tr> </table> <i>move the square above to choose your answer</i> REPORT EXTRACTION <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>3</td> </tr> </table> <i>move the square above to choose your answer</i> DATA VALIDATION <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>3</td> </tr> </table> <i>move the square above to choose your answer</i> QUESTIONNAIRE DEVELOPMENT <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>3</td> </tr> </table> <i>move the square above to choose your answer</i>	1	<input checked="" type="checkbox"/>	2	3	1	<input checked="" type="checkbox"/>	2	3	1	<input checked="" type="checkbox"/>	2	3	1	<input checked="" type="checkbox"/>	2	3
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Do you give your consent for your answers to be used anonymously for research purposes? 1, Yes, I consent to my anonymised answers being used for research purposes. 2, No																

At all, 15 attendants thought the amount of content suitable for the purpose of the training, but a researcher, a research assistant and two post-graduation students would like more time

“to deepen and expand knowledge”, “for training on a concrete project” or “for mastery in using the tool”. All the attendants agreed with the difficult level of the content and stated to be interested in learning more on REDCap and incorporating it into the work routine. Fifteen respondents self-assessed their pre-post learning on form designing from zero to 80%, on average (range: 50% - 100%). One post-graduation student assessed her progression to design a REDCap form as zero.

EIGHT STEP: Challenges and solutions

Perhaps, if a specific tool or method is not embedded in the local scientific culture, the research community may not recognize it as a gap that should be solved. Given the low experience with REDCap among researchers of IAM, the tutor asked them to indicate post-graduation students and research assistants to attend to the SLS. Furthermore, she asked her own students to attend to the SLS, as a comparative group with different profile.

In Pernambuco, only 5 centres for health research have a REDCap licence. All these centres are in Recife, the capital of Pernambuco State. Among 40 researchers of the Post Graduation Program in Public Health of IAM - Fiocruz Pernambuco, only three had already used the REDCap. This very low knowledge on REDCap by the scientific community of IAM could lead researchers to unrecognize its usefulness and suitability for developing clinical research.

Fortunately, some researchers, who already had heard or used the software, became interested in their post-graduation students and research assistants learn on REDCap. This can have influenced the well attendants' commitment and good learning progression. The same may have happened with the tutor's students. Furthermore, the novelty of the subject seems to be essential to retain the attendants' interest during the lectures.

Some operational challenges are worth attention, such as the agenda to get a group with the same profile. Scheduling the lectures by consensus with each group seems to be a good strategy to get a uniform and committed group. In turn, the original idiom of the Project REDCap can introduce some difficulty. Despite an online translation can be used by the browser, the Project REDCap website and all training resources at the platform are in English. During the SLS, it was noticed that some errors can occur when drafting a form while the browser's auto-translator is activated. So, it is recommendable to design a project on REDCap without such a tool.

NINTH STEP: Plans for the future

This step-by-step report intends to serve as a guide for others SLS, and maybe help to ensure their reliability and standardization. Given the positive experience of the SLS *Customization of Instruments for Data Collection and Storage in REDCap - BASIC PRACTICAL TRAINING*, the coordinator of the Post Graduation Program for Public Health suggested the tutor make it a regular training for the post-graduation students. Additionally, the tutor is planning to disseminate the REDCap within scientific communities of country cities in Pernambuco. In Pernambuco, the Federal and State universities have decentralized unities in some cities far

from the capital, and so some new scientific communities are emerging and need to be up to date with resources that ensure data integrity. Eventually, to advertise and teach REDCap among health science students is a critical task to improve the capacity in research in our locality. For that, the International Federation of Medical Students Associations (IFMSA) could be a good partnership, locally and beyond.

¹PA Harris, R Taylor, R Thielke, J Payne, N Gonzalez, JG. Conde, Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support, *J Biomed Inform.* 2009 Apr;42(2):377-81.

²PA Harris, R Taylor, BL Minor, V Elliott, M Fernandez, L O'Neal, L McLeod, G Delacqua, F Delacqua, J Kirby, SN Duda, REDCap Consortium, The REDCap consortium: Building an international community of software partners, *J Biomed Inform.* 2019 May 9 [doi: 10.1016/j.jbi.2019.103208]

KKS Garcia, AA Abrahão. Research Development Using REDCap Software. *Healthc Inform Res.* 2021 Oct;27(4):341-349 [doi: 10.4258/hir.2021.27.4.341]

Customization of Instruments for Data Collection and Storage in REDCap

BASIC PRACTICAL TRAINING

Tutor: Dr Cristiane Bresani (clinical researcher, Fiocruz PE)

Facilitator: Dayvson (IT technician, Fiocruz PE)

Audience: researchers and research assistants, postgraduate and undergraduate students in the health sciences.

Venue: at the teaching and research institution itself in a room with multiple computers with web access.

Method: Hybrid Learning Sessions

Justification: Among the research training methodologies proposed by the TGHN, the Hybrid Learning Sessions require evidence from experience reports, and there is still no toolkit available for replication in different locations. The REDCap (Research Electronic Data Capture) theme was chosen because in the IAM-Fiocruz Pernambuco research ecosystem, as well as in the NeuroCOVID study team, the vast majority of researchers and students do not use REDCap and were unaware of its usefulness and importance as a tool for collecting, storing and sharing data, in order to guarantee the security and integrity of the data, within national and international regulatory and legal standards. As for the resources related to the subject on the TGHN platform, there is a link to the REDCap Project page (<https://www.project-redcap.org/>), containing various resources in English, as well as a link to one of REDCap's partner institutions, The Harvard Clinical and Translational Science Center, which is closed access (<https://rc.partners.org/research-apps-and-services/collect-data#redcap>), a short e-learning course specifically restricted to the completion of a questionnaire by the NeoObs study team (https://globalhealthtrainingcentre.tghn.org/elearning/education/NeoObs_Study_Training/neoobs-how-to-redcap/5432/).

Objectives:

- To train students and health professionals in the basic use of the REDCap platform to customise epidemiological, clinical and experimental research instruments.

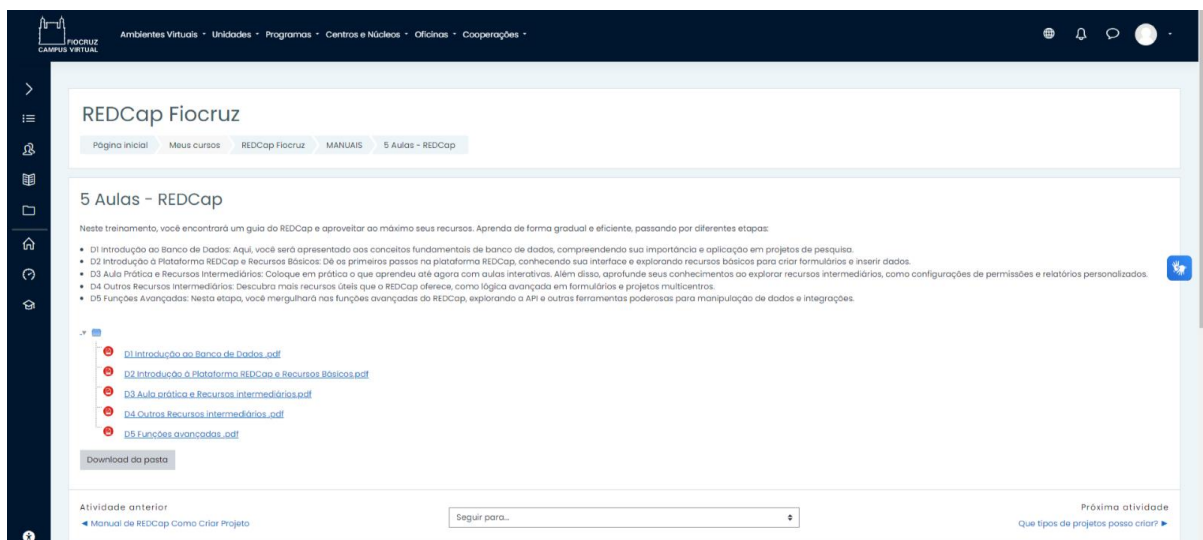
- To test a Supported Learning Sessions format in three pilot trainings with different audience profiles.
- Describe and improve the method used, producing evidence on its usefulness and contributing to the composition of a toolkit on how to carry out Hybrid Learning Sessions.
- Produce and identify REDCap resources that can be made available on the TGHN platform, TGHN LAC and Fiocruz com hubs.

Format: face-to-face lectures, followed by applied practical exercises, complemented by synchronous and asynchronous online resources.

Description: Those enrolled will be divided into 3 groups, which will follow the same format and content: a 1st group of professionals from Fiocruz Pernambuco (n = 5-8), a 2nd group of postgraduate students from Fiocruz Pernambuco (n = 6-10) and a 3rd group of undergraduate students from any educational institution who are developing projects with researchers from Fiocruz Pernambuco (n = 8-12). Before the start of the training, those enrolled will be asked to complete a questionnaire on their previous knowledge and experience with the REDCap platform and will be instructed to complete Module 4 of the online course Research in Clinical Practice 2021: Research in Clinical Practice Workshop Resources (REDCap: Tool for Data Collection and Management), which provides an introductory overview of the importance and practical usefulness of the tool in clinical research, available in the REDe/TGHN Workshop resources 'Research in Clinical Practice 2021' (<https://rede.tghn.org/workshops2020/research-clinical-practice-2021/resources/>).

The REDCap platform and its tools for customising research instruments will be presented and explained over 3 days, through one in-person lecture per day, lasting 30 to 40 minutes, followed by a further 1 hour of assisted practice, where open-access online learning resources will be presented, in particular the websites of the REDCap Project and the REDCap Fiocruz Community

(<https://cursos.campusvirtual.fiocruz.br/local/meucampus/courseinfo.php?id=1072>). The REDCap Fiocruz Community contains many learning resources in Portuguese, so the three lectures will be based on the slides from the first 3 lessons of the REDCap course available on its website, as seen in the figure below.



For the face-to-face assisted practice sessions, REDCap IN 1 MINUTE video lessons will be used, in which participants will be guided sequentially through the step-by-step construction of a research instrument, at the same time as they begin to build the first module of their own instrument. To do this, participants will be asked to bring a real research instrument in another format to class, which they are using, creating, or have already used or wish to use.



After successfully completing the three stages, the participants will be instructed to build a second module of the tool on their own, to be delivered within a week, during which time the tutor and facilitator will be in contact with the students to help them with their questions, either in person or remotely, depending on their needs. At the end of the training, the tutor will assess the instruments in terms of content, format and usability, and the participants will be asked to complete a questionnaire on their current knowledge and experience of the REDCap platform during the training.

Support resources

REDCap Project website: <https://www.project-redcap.org/>

REDCap
research | education | data | culture

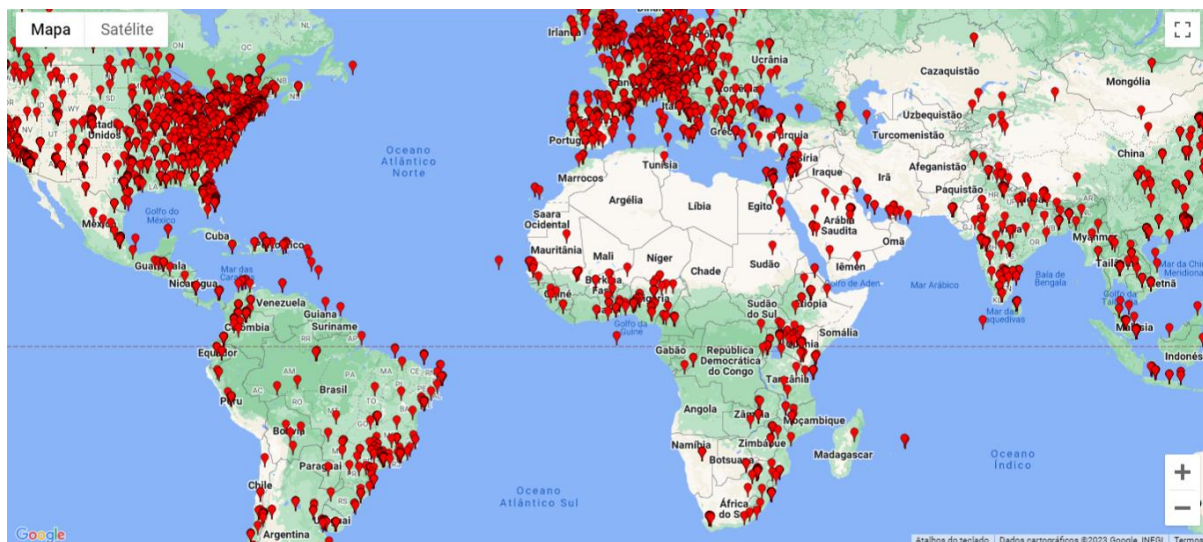
Institutions: 6819 | Countries: 155 | Projects: 1.9M | Users: 2.9M | Citations: 34.8k

ABOUT | PARTNERS | RESOURCES | SOFTWARE

Used in over 150 countries

REDCap is a secure web application for building and managing online surveys and databases. While REDCap can be used to collect virtually any type of data in any environment (including compliance with 21 CFR Part 11, FISMA, HIPAA, and GDPR), it is specifically geared to support online and offline data capture for research studies and operations. The REDCap Consortium, a vast support network of collaborators, is composed of thousands of active institutional partners in over one hundred countries who utilize and support their own individual REDCap systems. Please visit the [Join](#) page to learn how your non-profit organization can join the consortium, or explore the first section on our [FAQ](#) for other options.

REDCap Consortium map: https://redcap.vanderbilt.edu/consortium/map_fullscreen.php

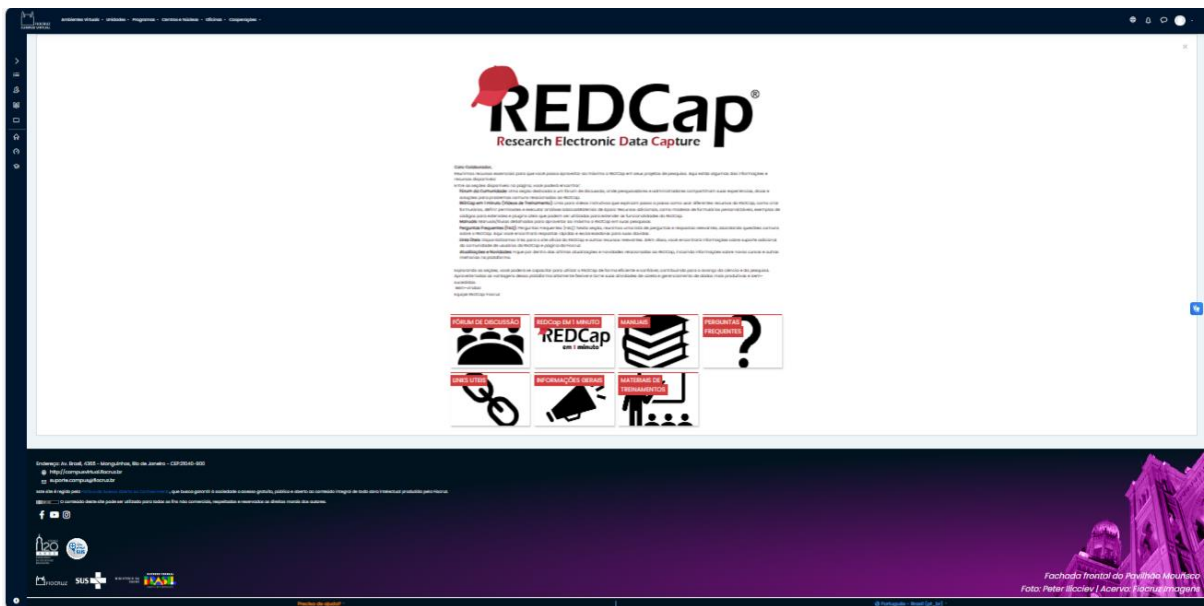


REDCap

Fiocruz

Community:

<https://cursos.campusvirtual.fiocruz.br/local/meucampus/courseinfo.php?id=1072>



Results and products:

- Number of researchers and students trained.
- Successful experience reports.
- Follow-up and evaluation after 3m + 3m of registrants on the use of REDCap.
- Contribution to a toolkit on how to design and run Supporting Learning Sessions.
- Contribution to online resources on REDCap.