

DEVELOPING A DASHBOARD TO VISUALISE AGENTS AND STAKEHOLDERS



This toolkit aims to demonstrate the steps, materials and information needed to create a **personalised dashboard** that displays relevant information about the **agents and stakeholders involved in a study**.

Strategies for selecting the information to be displayed, possible platforms for presenting the data and options for customising the dashboard layout will be presented. This will make the dashboard development process more efficient, helping teams to deepen their understanding of the agents involved and their role and relevance in conducting a study.

What will I find in the toolkit?

This toolkit, which brings together explanations, visual examples, tools and resources applicable to the construction of the dashboard, is presented in four phases:

- Pathfinder projects: contextualisation of Pathfinder projects, potential applications, and its mapping structure;
- The dashboard: section dedicated to presenting the concept of the dashboard, its application to the theme, and the tools and technologies needed to build it;
- Establishing objectives for stakeholder visualisation: section with guiding questions and examples to help define objectives for developing the dashboard;
- Step-by-step dashboard construction: step-by-step guide describing the phases and the tools used to build the dashboard.
- Outcomes: possible outcomes and benefits of developing a dashboard for visualization of agents and stakeholders.

PATHFINDER PROJECTS

Pathfinders are additional projects to host studies, focusing on mapping the processes of research cycles. Using a critical approach, they seek to identify obstacles faced, lessons learnt, skills gaps, technological infrastructure and the human resources involved in the studies.



The mapping of a study, through the methodology adopted in Pathfinder, is done using the Tracker, a tool developed to record quantitative and qualitative information and to organise the host study's research activities. Adaptable to the context and stage of development of each study, the Tracker is divided into five categories:

- Research planning
- Data management and access
- Data analysis
- Results and impact
- Stakeholder engagement

Agent and stakeholder engagement

Identifying aspects of stakeholder engagement involves, among other things:

- Planning actions for interaction and involvement with the public, professionals in the field and public policy makers;
- Implementation of additional studies and research impact perceptions;
- Communication and dissemination efforts, such as participation in conferences and workshops;
- Encouragement of data reuse.

Identifying the agents involved helps to recover the memory of the study and, in the case of research that is being structured, to map out how it will be built. Identifying the agents is the key to mapping. From there, creating and implementing stakeholder visualisation tools are strategies to expand Pathfinder's communication and information efforts and highlight the work of the agents who participated directly or indirectly in the study. They also demonstrate the importance and participation of these agents throughout the research cycle, making it possible to understand the variety and qualities of this set of collaborations that made the host study possible, so that researchers who want to develop similar studies can start from an adaptable list of agents and stakeholders to involve.

THE DASHBOARD

A dashboard is a visual representation of essential and relevant information presented in a summarised and accessible way in one place, usually on a single screen or panel. This information can include graphs, tables, metrics, key performance indicators (KPIs) and other visual elements that help track, monitor, and analyse data in real time or over a given period.

Dashboards can be used in a variety of contexts. In the specific case of Pathfinder, they are important tools for demonstrating the organisation of the team involved in each stage of the study, distribution and positions, functions and roles, offering a consolidated and dynamic view of the study's organisational structure.



Through the dashboard, it is possible to share the variety of people, organisations and stakeholders involved in developing a research project with other studies of similar interests. For Pathfinder projects, the dashboard makes it possible to see the intersections between agents and stakeholders, individuals and organisations, by institution, type of participation and role. It also gives visibility to the complexity of the work, demonstrating the diversity of profiles, skills and competences required for the project.

Tools and skills needed to build the dashboard

The goal is that any professional can develop graphs from the file planned with the tools in this toolkit, if they can get to grips with creating graphs in the ELK ecosystem to Elasticsearch - Logstash - Kibana.

To build the dashboard, a combination of tools and programming languages must be applied:

- Spreadsheet editor
- Text editor for programming
- Python file execution environment
- ELK Ecosystem to Elasticsearch - Logstash - Kibana

	In this dashboard	Possibilities
Spreadsheet editor	Microsoft Excel	Libre Office Calc, Google Sheets (free)
Text editor for programming	Notepad ++	Sublime ; Jupyter Notebook
Python file execution environment	Linux terminal with Python and its libraries installed	Jupyter Notebook ; VSCode

There are alternatives to the ELK Ecosystem for creating dashboards, such as:

- Tableau - proprietary software. It offers a trial to test the tool;
- Power BI - there are Desktop versions (free) and Pro and Premium versions (paid);
- Google Data Studio - there are free and 360 (paid) versions.

Each application has specific characteristics, and it is important to have in-depth knowledge of one of them to build a dashboard like the one in this example.

ESTABLISHING OBJECTIVES FOR STAKEHOLDER VISUALISATION

The first fundamental step in developing a dashboard is to define its objectives and requirements. Before starting to design and build it, it's important to have a clear understanding of what you hope to achieve. A few questions can help establish the main points for the dashboard:

- What do we want to show with this dashboard?



- What is our main objective?
- What audience is this dashboard being designed for?
- What are the main characteristics of the agents and stakeholders to be visualised?
- What cross-references of information are fundamental to fulfilling my objectives?

Defining variables

The selection of variables to be projected on the dashboard will vary according to the structure of the host study and the informational goals related to the presentation of the agents and stakeholders involved. They will also be influenced by the type of mapping carried out by Pathfinder - whether the project is based on a study that has already been carried out or is structured in parallel to the host investigation. Not all the information included in the agent mapping will be needed for the dashboard or can be displayed on it, such as the names of all the agents involved. Therefore, the objectives of the dashboard must be in line with these limitations.

We will use the case of the Pathfinders Vacina Maré and Nascer no Brasil II as an example:

	Vacina Maré Pathfinder	Pathfinder Birth in Brazil II
Host study	The Vacina Maré research aimed to estimate the effectiveness of the COVID-19 vaccine and the impact of the pandemic based on the Vacina Maré Campaign, a community mobilisation for mass immunisation.	The Birth in Brazil II study, a survey of births, deliveries, and foetal losses, integrates different fronts of analysis on the processes from pregnancy to the puerperium.
Number of agents and stakeholders mapped	158	759
Scope	Local	National
Study duration	2021 - 2023	2020 - 2024

The projects' different profiles resulted in important particularities in the mapping of variables, which consequently shaped the results of the dashboard visualisation.



Mapped variables

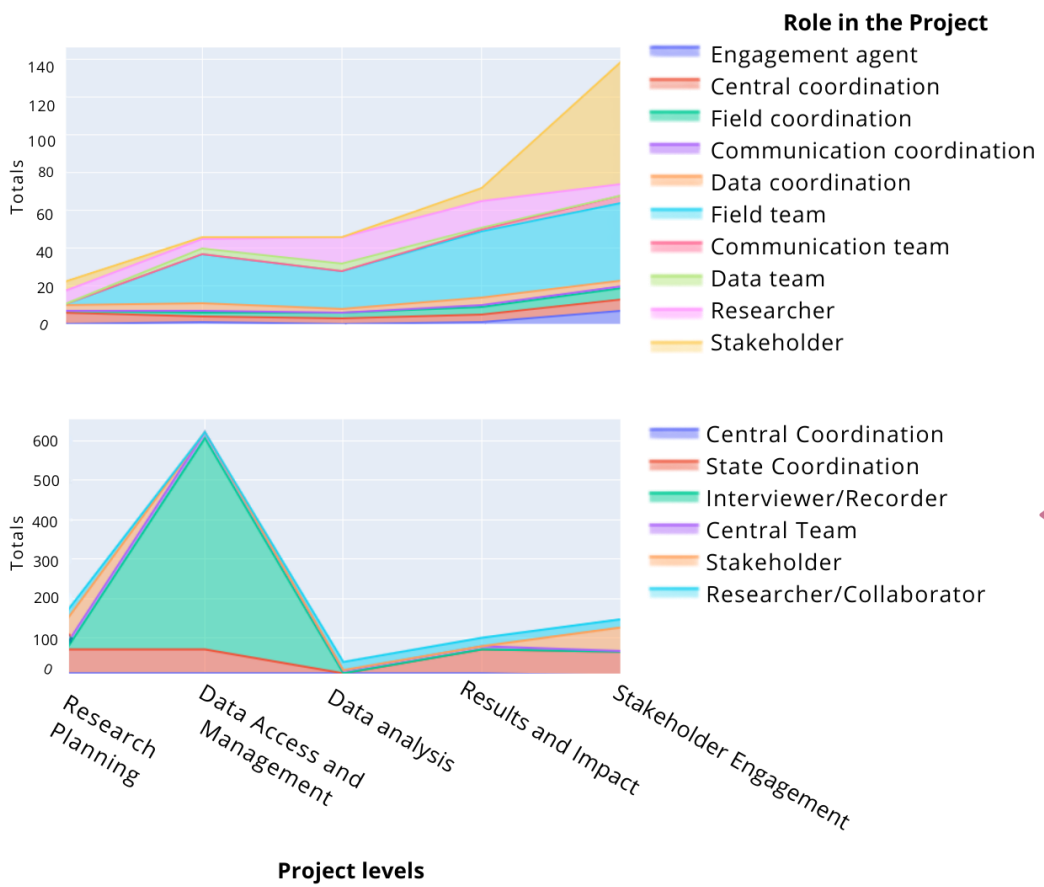
Vacina Maré Pathfinder	Birth in Brazil II Pathfinder
Name of the agent/ stakeholder	Name of the agent/ stakeholder
Role in the study	Role in the study
Name of the institution	Name of the institution
Acronym of the institution	Acronym of the institution
Institution group	Institution group
Type of partnership	Municipality/UF
Subdivision of the role of the field team	Agent or stakeholder
Municipality/UF	Start of research activity
Agent or stakeholder	End of research activity
Participation in the study phase	Time of research activity (months)
Participation in Vacina Maré activities	Participation in the study phase

Despite having common topics for mapping agents and stakeholders, such as nominal identification, role in the study and information about their institutions of origin, the differences in the studies' design are highlighted by the definition of specific variables, like the subdivision of the field team's role (Vacina Maré) and the beginning and end of their work in the research (Birth in Brazil II), for instance. It is also possible to find differences in common topics, such as the role in the study, which is represented by different areas between the two investigations:



Variables for building the dashboard

Vacina Maré Pathfinder	Birth in Brazil II Pathfinder
Agent/stakeholder name	Agent/stakeholder name
Role in the study	Role in the study
Name of institution	Name of the institution
Institution acronym	Acronym of the institution
Institution group	Institution group
Type of partnership	Municipality/UF
Subdivision of the function of the field team	Agent or stakeholder
Municipality/UF	Start of research activity
Agent or stakeholder	End of research activity
Participation in the study phase	Time working in the research (months)
Participation in Vacina Maré activities	Participation in the study phase



In the dashboard's case, the application of these variables must be in line with the visualisation objective defined by the Pathfinder and host study teams or any research that proposes its construction. Thus, although necessary for mapping, not all the information gathered will necessarily be used to structure the dashboard.

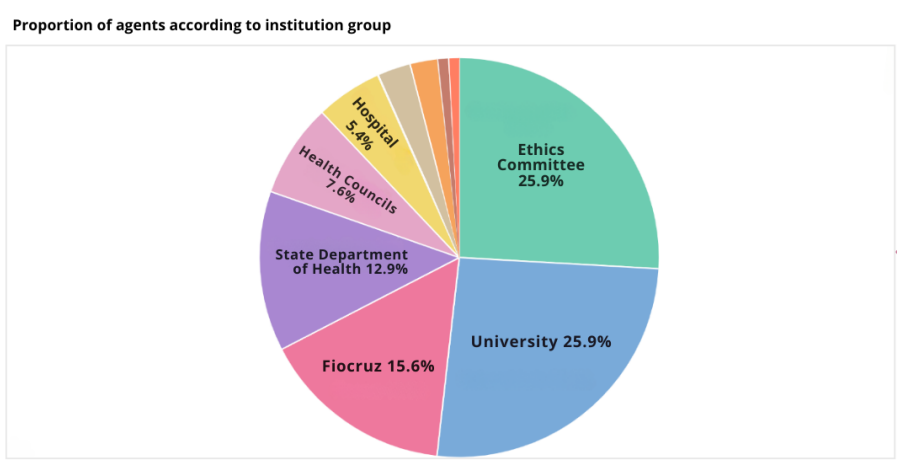
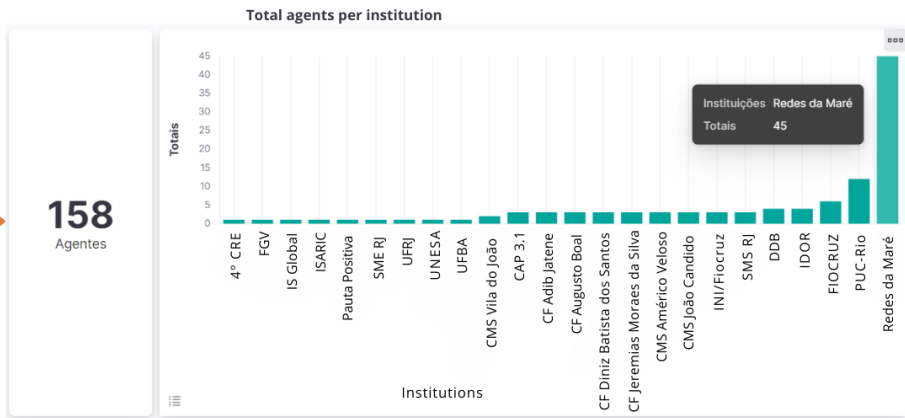


The names of the agents, for example, were mapped to record the people involved, but this information is only for the internal team carrying out the study and the Pathfinder, being omitted from the dashboard of both studies.

For the Birth in Brazil II Pathfinder, the institutions were not listed by name on the dashboard, but only in groups of areas of activity. For the Vacina Maré Pathfinder, part of the dashboard is dedicated to visualising the number of agents per institution.

Variables for building the dashboard

Vacina Maré Pathfinder	Birth in Brazil II Pathfinder
Agent/stakeholder name	Agent/stakeholder name
Role in the study	Role in the study
Name of institution	Name of the institution
Institution acronym	Acronym of the institution
Institution group	Institution group
Type of partnership	Municipality/UF
Subdivision of the function of the field team	Agent or stakeholder
Municipality/UF	Start of research activity
Agent or stakeholder	End of research activity
Participation in the study phase	Time working in the research (months)
Participation in Vacina Maré activities	Participation in the study phase





The variables "Start" and "End of research activity" were not mapped for Vacina Maré. For Birth in Brazil II, only information on the total time in months of participation in the study for each agent or stakeholder was used, as the Central Team chose to emphasise this aspect due to the length of the research period and the different teams working concurrently. The national scope of the study was a determining factor in the choice to include the visualisation of a distribution map of field agents for the Birth in Brazil II, a particularity that differs from the Vacina Maré research, which was carried out locally.

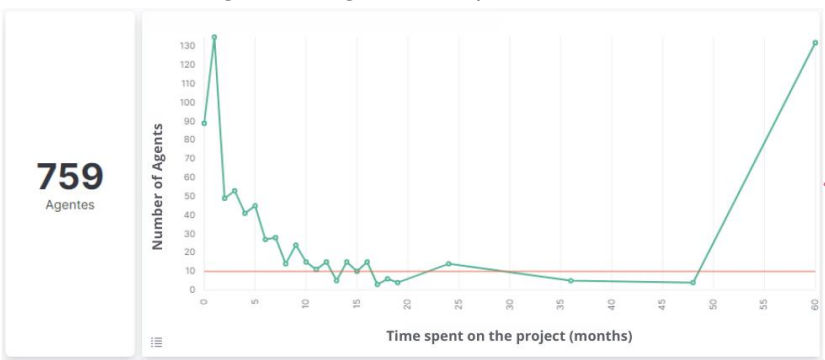
Variables for building the dashboard

Vacina Maré Pathfinder	Birth in Brazil II Pathfinder
Agent/stakeholder name	Agent/stakeholder name
Role in the study	Role in the study
Name of institution	Name of the institution
Institution acronym	Acronym of the institution
Institution group	Institution group
Type of partnership	Municipality/UF
Subdivision of the function of the field team	Agent or stakeholder
Municipality/UF	Start of research activity
Agent or stakeholder	End of research activity
Participation in the study phase	Time working in the research (months)
Participation in Vacina Maré activities	Participation in the study phase

Number of agents according to Brazilian state of activity in the research



Number of agents according to total time spent on research in months





Note that the definition of variables was not done in a single moment and the layout of the information on the dashboard undergoes tests, modifications and adaptations as the mapping visualisation is generated and other needs and objectives emerge from observing the product. Consultation with the research teams is essential to adjust and validate the results.

STEP-BY-STEP DASHBOARD CONSTRUCTION

- 1- With the [source data spreadsheet](#), use a spreadsheet editing software to clean and standardise the data.
- 2- Convert the spreadsheet into JSON format to be inserted into the ELK environment. This can be done using a [script in Python](#) or another language.
- 3- Install the ELK ecosystem locally or in a Virtual Machine.
A virtual machine (VM) is an emulation software that simulates a physical computer environment. It operates as if it were a complete computer inside another computer. This allows you to run multiple operating systems (such as Windows, Linux, MacOS) on a single piece of physical hardware. After that, the environment is prepared according to the links below:
<https://www.elastic.co/guide/en/kibana/current/install.html>
<https://www.elastic.co/guide/en/kibana/current/windows.html>
- 4- Upload the JSON file converted in step 2 to ELK and, if necessary, customise the format or labels of the fields (insert video).
- 5- Choose the chart that best suits your needs and create the dashboard in ELK.
To create graphs/dashboards in Kibana/Elastic use the links below as a tutorial:
<https://www.elastic.co/guide/en/kibana/current/dashboard.html>
<https://www.elastic.co/guide/en/kibana/current/create-a-dashboard-of-panels-with-web-server-data.html>
 - a. If the graphs provided by ELK don't meet your requirements, choose a language to develop the graph, such as Python, Java Script, R and integrate it with the dashboard generated by ELK.

Dashboard outcomes for visualising agents and stakeholders

- ➔ To visualise the network of agents, collaborators and institutions involved in a project or study;
- ➔ To provide an understanding of the scale of the study for researchers interested in reusing the data;
- ➔ To qualify/subsidise reuse by other researchers not involved in the collection stages;
- ➔ To emphasise the integration of the agents involved;
- ➔ To share the structure of personnel and network needed to carry out the study;
- ➔ To support other studies in the reproducibility of the study to identify the organisational profile and in mapping the functions needed to conduct it.