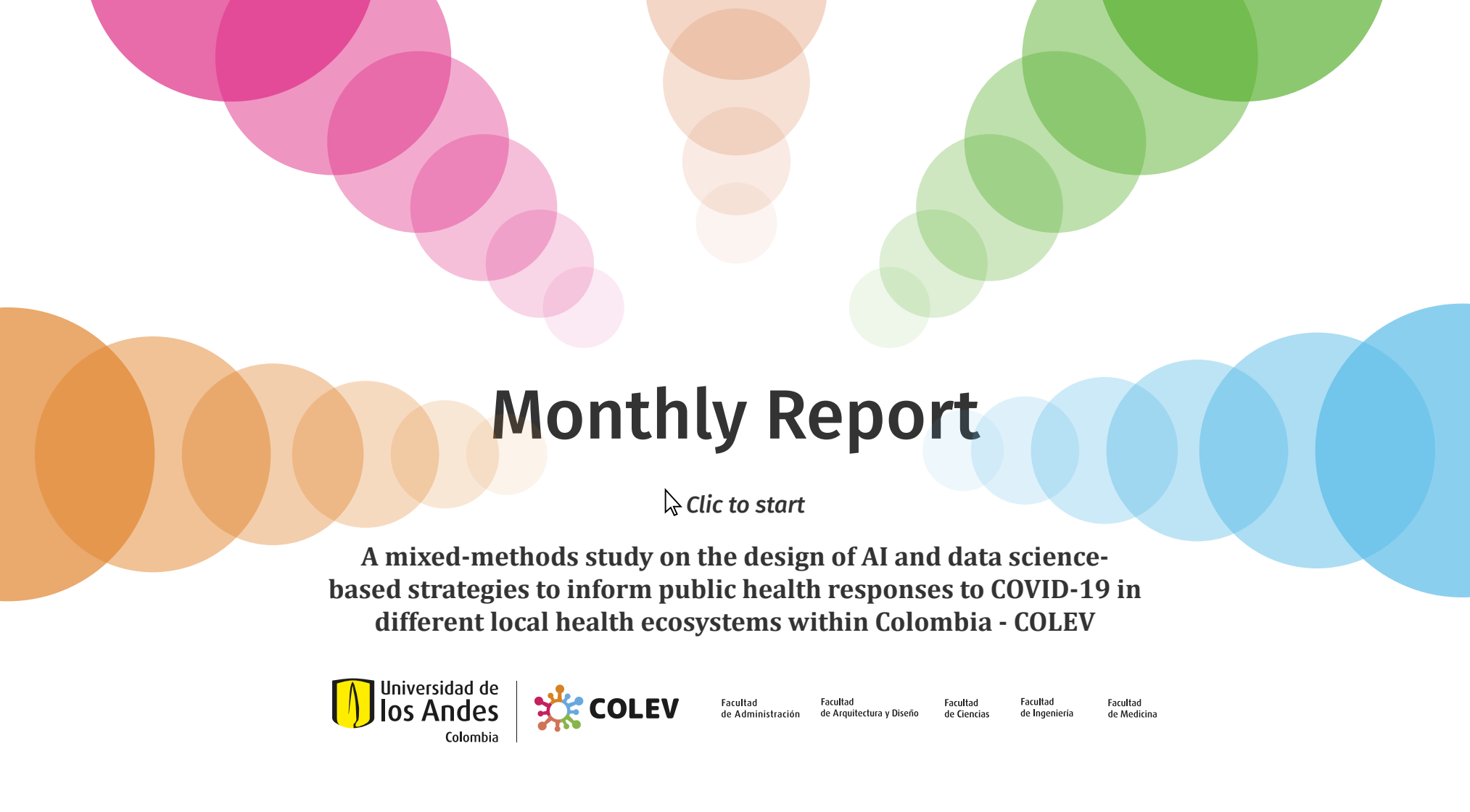




# Monthly Report

 *Clic to start*

**A mixed-methods study on the design of AI and data science-based strategies to inform public health responses to COVID-19 in different local health ecosystems within Colombia - COLEV**



*This document includes a monthly report of our activities, divided by:*

- 1. Progress by objective.*
- 2. Outreach activities.*
- 3. Team consolidation.*
- 4. Events.*
- 5. Media Appearances.*

 *Clic to continue*

# Contents

2021

2022

# Contents 2021

*February*

*May*

*August*

*November*

*March*

*June*

*September*

*April*

*July*

*October*

# Contents 2022

*January*

*February*

# Index - February

*Progress by objective*

*Outreach*

*Team Consolidation*

*Events*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## MAP OF ACTORS

**Planning and developing a map of actors relevant for decision-making in the health and education sector.**

*To characterize the health ecosystem.*

- 1. Five meetings with stakeholders that provided feedback to the map.*
- 2. Database of key actors with contact information.*

## QUALITATIVE DATA COLLECTION

**Developing interview guidelines**

*Interview guidelines for decision-makers and developers of tools based on data science and AI relevant to understand or act upon COVID-19.*

**Pilot interviews with researchers working in modeling COVID-19 related topics.**

*To test and improve interview guidelines for developers.*

*Interview guidelines for developers.*



## Objective 2 - COVID-19 Models

### **SCHOOL RE-OPENING**

#### **Presentation of results**

*To socialize the results of mathematical modeling about school-re opening to a broad audience.*

*Our research team members presented their results in a seminar to a general audience, including high school teachers and parents.*

<https://www.youtube.com/watch?v=Vsem1MZXRtU>

# Objective 3 - COVID-19 and health operations management

## VACCINATION LOGISTICS

### Panel - Vaccines: We finally bought them, now what?

*To promote a constructive dialogue that allows reflecting on the importance of vaccination logistics for implementing the new National Plan of Vaccination against COVID-19. As well as anticipate potential challenges on the uptake, storage, and distribution of vaccines at a national and local level.*

*Representatives from the Ministry of Health (National Level) and health secretariats (Local level) talked about their plans for vaccination in their territories. Insurance companies' representatives and hospitals in Bogotá and other cities in Colombia pointed out the main upcoming challenges from their perspective.*

*We had three representatives from each sector talking about their perspectives.*

*The total attendance at this virtual event was:*

 :330

 :638

<https://medicina.uniandes.edu.co/es/colev/vacunas>



## **Feedback from the first day of vaccination**

*To inform the ministry of health and local authorities about certain practices around logistics to improve vaccination speed after the first day of vaccinations in Colombia*

*We sent a personal communication to the Ministry of Health and the Health Secretariat from Bogotá with recommendations about the logistics of the process.*

## **Recommendations about the implementation of the National Vaccination Plan against COVID-19 in Colombia.**

*To socialize the recommendations for implementing the National Vaccination Plan against COVID-19, highlighting the challenges and opportunities identified by several actors of the health ecosystem.*

*Recommendations for implementing the National Vaccination Plan against COVID-19 in Colombia.*

<https://uniandes.edu.co/es/noticias/salud-y-medicina/vacunas-contra-el-covid19-ya-las-compramos-y-ahora-que>



## **Objective 4 - Social Media and COVID-19**

### **TWITTER DEVELOPER ACADEMIC TRACK REQUEST**

#### **Application for Twitter Developer's Academic Track**

*To improve tweet throughput and query fidelity.*

*Approval and authentication keys, secrets, and tokens for using the recent, historic, and stream search APIs.*

### **DESIGN, TESTING, AND IMPLEMENTATION OF STANDARDIZED TWEET COLLECTION**

#### **Development of python scripts for automatic collection of tweets**

*To standardize and automate tweet collection using a list of predefined COVID-19-related keywords, language, and geo-tags.*

*Python scripts and Jupyter notebooks.*

<https://drive.google.com/drive/folders/1v8j4mfgRj4YAVIy6yfkMQUsyuiHOiR2U>



## TWEET ANALYSIS

### **Text preprocessing of tweets and Facebook posts.**

*To perform text processing including tokenization, lemmatization, and creation of text embeddings using several methods: bag of words, word2vec, doc2vec, and sentence transformers (i.e., BERT and ROBERTA).*

*Python scripts and Jupyter notebooks.*

<https://drive.google.com/drive/folders/1v8j4mfgRj4YAVIy6yfkMQUsyuiHOiR2>



## Objective 5 - Dis and misinformation museum

### **SOCIAL MEDIA ANALYSIS STRATEGY**

**Presentation of results of social media data explorations to be used as the basis of the communication strategy.**

1. *Exploration of retweets about high school come back, tracking Fecode and Ministerio de Educación accounts. Knime.*
2. *Track of nodes of disinformation sources, Twitter. Example Fedegan account. Knime.*
3. *Track of conversation in Social Media, Vaccines and High Schools. Knime.*
4. *Proposal for a social media data integration. Google Trends and Twitter.*
5. *Plan to create an online archive of dis and miss information in Colombia. Omeka.*

[https://docs.google.com/presentation/d/14P5u9n4q4tJbtWeYAG4SNm\\_UstcVnk\\_w3VVnEzsbGKo/edit?usp=sharing](https://docs.google.com/presentation/d/14P5u9n4q4tJbtWeYAG4SNm_UstcVnk_w3VVnEzsbGKo/edit?usp=sharing)

# Outreach



## **PROJECT SOCIALIZATION**

### **Ministry of Health - Epidemiology and Demography officers**

*To socialize the COLEV project and validate the cross-cutting topics of COLEV*

*1. Definition of the cross-cutting topics of analysis for COLEV available at:*

<https://colev.uniandes.edu.co/images/presentacion/flyer-project-COLEV.pdf>



# Team Consolidation

## New team members



***Jaime Enrique Cascante Vega***  
*Infectious disease dynamics modeller*



***Estefania Hernández Pineda***  
*PhD Student in Administration*



***Isabela Ortiz Jaramillo***  
*Master student in Design*



***Angela María Mora Lara***  
*Master student in Design*

# New Alliances



## *Cooperation with Observatorio de la Democracia.*

*To potentiate the analytical efforts of the team around the characterization of the online conversation about COVID-19.*

*Strategic alliance with Observatorio de la Democracia to collaborate on the characterization of the online public chatter about COVID-19*

<https://politicayredes.obsdemocracia.org/>

# Events

## VACCINES: WE FINALLY BOUGHT THEM, NOW WHAT?

[See event video](#)

### Memories:

[See event memories](#)

[Infographic](#)

[Key Points](#)



# Index - March

*Progress by objective*

*Gender approach*

*Team Consolidation*

# Progress by objective

*Objective 1*

*Objective 5*

*Objective 2*

*Objective 3*



## **QUALITATIVE DATA COLLECTION**

**Data collection with developers working in modeling COVID-19 related topics.**

*To identify developers from academic scenarios that develop mathematical models and analytical tools for decision-makers using data science or AI.*

*List of developers and main contacts*

### **Interviews**

*Seven (7) interviews with developers*

*One (1) interview with high-level decision makers*



## Objective 2 - COVID-19 Models

### **SCHOOL RE-OPENING**

#### **Presentation of results**

*To socialize the results of our mathematical models to experts in education to refine and adjust the simulation about returning to schools, including PPE and ventilation in the classrooms and refining the models' analysis and parameter.*

*Presentation to experts in education from the University.*

#### **Development of a communication piece.**

*Socialization of the results about school reopening with an interdisciplinary perspective.*

*Third draft of the piece*



## Objective 3 - COVID-19 and health operations management

### **VACCINATION LOGISTICS**

#### **First approach to Vaccination metrics**

*Standardization of data base, definition of the platform to develop the dashboard*

*Automatized databases with metrics and formulas for evaluating the vaccination process in Colombia*

#### **Definition and calculation of indicators about logistics in vaccination.**

*Dashboard: Follow-up to the vaccination process in Colombia.*



## Objective 5 - Dis and misinformation museum

### *DISINFORMATION DATA SET DEVELOPMENT*

#### **Development of a dataset of missinformation**

*Open-access dataset about missinformation*

# Gender approach



## **TEAM DISCUSSIONS**

**How to analyze the role of gender in COLEV?**

*To reflect on gender approaches to apply on COLEV*

*Identification of needs and questions regarding this topic*



# Team Consolidation

## New team members



***Maria Galvis Malagon***  
*Anthropologist*



***Sandra Patricia Martinez Cabeza***  
*Postdoctoral Researcher*



***Johanna Trujillo Diaz***  
*Postdoctoral Researcher*

# Index - April

*Progress by objective*

*Media Appearances*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## QUALITATIVE DATA COLLECTION

### Interviews

1. *One (2) interviews with developers (total = 9)*
2. *One (1) interview with high-level decision-makers (total = 2)*
3. *Ten (10) interviews with middle-level decision-makers*

## QUALITATIVE ANALYSIS

### Data analysis.

1. *A preliminary set of categories for coding*
2. *7 interviews have been analysed*



## Objective 2 - COVID-19 Models

### **CASE FORECASTING**

**Forecasting of cases for Cartagena.**

*Socialization of the results with peers.*

[https://www.dropbox.com/s/8440ypygundbsq1/cartagena\\_05-04-2020.pptx?dl=0](https://www.dropbox.com/s/8440ypygundbsq1/cartagena_05-04-2020.pptx?dl=0)

**Outreach for the creation of a forecasting hub for Latin America based in Uniandes.**

*Protocol for the functioning of a forecasting Hub*

[https://www.dropbox.com/s/p093t75cqrlrxc7b/Resumen\\_avances\\_objetivo\\_2\\_mar\\_24.pptx?dl=0](https://www.dropbox.com/s/p093t75cqrlrxc7b/Resumen_avances_objetivo_2_mar_24.pptx?dl=0)



## Objective 3 - COVID-19 and health operations management

### VACCINATION LOGISTICS

**Protocol design for studying the vaccination process against COVID-19.**

*Develop an analytical strategy involving primary data collection that aims to simulate better practices optimizing vaccination processes in Colombia.*

*Research protocol to be presented to vaccination centers.*

[https://www.dropbox.com/s/azc70anw3xq9f2e/estudio\\_proceso\\_vacunacion.pdf?dl=0](https://www.dropbox.com/s/azc70anw3xq9f2e/estudio_proceso_vacunacion.pdf?dl=0)

**Vaccination process modeling and validation.**

*To make a graphical representation to specify the vaccination processes following the initial processes described in the National Vaccination Plan against COVID-19 using the BPMN language.*

*Generic vaccination process*



## Objective 4 - Social Media and COVID-19

### ONLINE CONVERSATION REGARDING COVID-19

#### Weekly Twitter and Facebook COVID-19 and global conversation analysis

*To show weekly analysis of the online Twitter conversation including topic modeling, NER, and part-of-speech tagging.*

*Weekly reports and presentations.*

<https://drive.google.com/drive/folders/1xcTY6UYkYb9XjWxqme6drujLzhgq7xzv>

#### Data collection and processing automatization

*To test and implement several NLP techniques for automatically analyzing raw text in social media. To define an ML pipeline including offline batch data collection, collation, storage, and preprocessing.*

*Python scripts, Jupyter notebooks, and analysis pipeline.*

<https://drive.google.com/file/d/1RQDrYyBx7PyhFtmq8AjcH0HI9lXgS0FV/view?usp=drivesdk>



## ONLINE CONVERSATION REGARDING COVID-19

### **Rapid response system to the COVID-19 conversation in twitter & facebook**

*To use the weekly data analysis to spark discussion and tackle desinformación regarding trending or viral detected topics*

*Twitter threads in response to the chosen weekly news*

[https://twitter.com/colev\\_uniandes?s=21](https://twitter.com/colev_uniandes?s=21)

### **Design of labeled dataset including tweets and facebook posts related to COVID-19 in Spanish for Colombia.**

*To design a dataset of Colombian-specific online public labeled text focusing on the following target features: vaccination, education, mental health, and domestic violence.*

*Dataset design methodology write up.*

[https://docs.google.com/document/d/1a6hgGzYGk9CLUXblByXHxik\\_1UsHLUecQA74T2tB\\_FY/edit](https://docs.google.com/document/d/1a6hgGzYGk9CLUXblByXHxik_1UsHLUecQA74T2tB_FY/edit)



## Objective 5 - Dis and misinformation museum

### **DISINFORMATION DATA SET DEVELOPMENT**

#### **Organization of dataset by News Fact Checkers from Colombia Check**

*Understanding of original organization of the dataset with a collection of all the fakenews related to Covid-19 in Colombia in the last year.*

*Museum of Disinformation dataset*

#### **Organization of dataset by News Fact Checkers from Colombia Check, data from Social Media**

*Adding Social Media Information to the dataset with a collection of all the fakenews related to Covid-19 in Colombia in the last year.*

*Museum of Disinformation dataset*

# Media Appearances

## **NATIONAL NEWSPAPER**

**Opinions regarding selective lockdowns.**

*To give COLEV point of view regarding selective lockdowns in Bogotá and the rest of the country.*

<https://www.elspectador.com/salud/cuarentena-en-colombia-la-frustracion-de-volver-al-encierro-article/>

# Index - May

*Progress by objective*

*Events*

*Media Appearances*

*Outreach*

*Gender Approach*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## QUALITATIVE DATA COLLECTION

### Interviews

1. Four (4) interviews with developers (total = 13)
2. Three (3) interviews with high-level decision-makers (total = 5)
3. Ten (10) interviews with middle-level decision-makers (total = 20)

## QUALITATIVE ANALYSIS

### Data analysis.

1. Seven (7) interviews have been analysed (total= 14)
2. Presentation of preliminary analysis to the research group

<https://www.dropbox.com/s/o8z6xtevi6kekm2/Que%20dicen%20los%20datos%20sobre%20los%20datos%20Mayo%202024.pptx?dl=0>



## Objective 2 - COVID-19 Models

### **SCHOOL RE-OPENING**

**Publishing of the final communication piece.**

*To communicate the estimated impact of reopening schools under different epidemiological conditions and the use of PPE and ventilation in classrooms.*

<https://colev.uniandes.edu.co/colev-en-accion/2-uncategorised/60-por-que-es-importante-abrir-los-colegios>

### **EARLY WARNING SYSTEM**

**Data processing of different sources of information.**

*To develop an early warning system of COVID-19 outbreaks based on several data sources, including COVID-19 related google search trends, Twitter posts; Mobility patterns from Unacast, Facebook, and google mobility; and centrality of contact networks based on mobile phone data.*

*Data processing of:*

- 1. Google search trends*
- 2. Mobility*
- 3. Twitter*
- 4. Facebook*



## ***AUTOMATED FORECAST REPOSITORY AND VIZ***

**Automated epidemiological model forecasting both SARS-CoV2 spread, and mortality using incident case counts by confirmation date and deaths.**

*Github repository with all the codes*

[https://github.com/biomac-lab/covid19\\_forecast](https://github.com/biomac-lab/covid19_forecast)



## Objective 3 - COVID-19 and health operations management

### VACCINATION LOGISTICS

**Launching of the dashboard: Follow-up to the vaccination process in Colombia**

<https://colev.uniandes.edu.co/colev-en-accion/2-uncategorised/58-avance-nacional-de-vacunacion>

**Socialization of the dashboard to critical stakeholders.**

*To present and validate the interpretability and usefulness of the logistics indicators to critical stakeholders and adjust the dashboard accordingly.*

*Meetings with:*

*A. Gabriel Carrasquilla - Asiesalud*

*B. Así Vamos en Salud*

<https://colev.uniandes.edu.co/colev-en-accion/2-uncategorised/58-avance-nacional-de-vacunacion>



# **Objective 4 - Social Media and COVID-19**

## **ONLINE CONVERSATION REGARDING COVID-19**

### **Basic visualization of key Twitter metadata**

*To create basic visualizations of tweet frequency, type, users, mentions, hashtags, cash tags, date, and device as well as likes, retweets, quotes, and replies.*

*Python scripts and jupyter notebooks*

<https://colab.research.google.com/drive/1ltot5Z9rZYgi1D8b609HBpsPC0cWnfg->

### **Meetings with NLP academicians**

*To meet with NLP professors and academics to discuss methodologies, techniques, theory, and limitations regarding text processing for analytics*

*Networking with Ruben Manrique and Alvaro Riascos*

### **Evaluation of NLP-related COVID-19 graduate class projects**

*To assess the reliability and validity of graduate student-led COVID-19-related class projects for an NLP class taught by Ruben Manrique at Universidad de los Andes*

*Project and dataset evaluation.*



## CHARACTERIZATION OF SOCIAL NETWORK AUDIENCES

### Characterization of internet and social network users by demographics in the Colombian population

*To characterize and describe the demographics of Internet, Facebook, Twitter and Whatsapp users including information regarding sex and age, among others. To visibilize inequities in access to social networks and to identify possible exlussions from the online discussion we monitor.*

*Text summary and info graphics*

<https://www.dropbox.com/s/e3cx1oo8bb2vbjs/Infograf%C3%ADas%20uso%20de%20redes%20sociales.pdf?dl=0>



## **Objective 5 - Dis and misinformation museum**

### **DISINFORMATION DATA SET DEVELOPMENT**

**Organization of dataset by News Fact Checkers from Colombia Check, metadata classification**

*Classifying with meta data the Information of the dataset with a collection of all the fakenews related to Covid-19 in Colombia in the last year.*

*Museum of Disinformation dataset*

**Processing of dataset by News Fact Checkers from Colombia Check, metadata classification**

*Adding Dublin Core metadata to the Information of the dataset with a collection of all the fakenews related to Covid-19 in Colombia in the last year.*

*Museum of Disinformation dataset*

### **UNDERSTANDING DISINFORMATION**

**Online conference by professor Andres Colubri about participatory simulations about SARS conducted by the University of Massachussetss.**

*Foster an international dialogue about disinformation and disruptive ways to tackle it.*

*On line conference: Epidemiology Participatory Simulations.*

<https://uniandes.edu.co/es/noticias/transmision-simulaciones-epidemiologicas-participativas>

# Media Appearances



## **NATIONAL NEWSPAPER**

### **Recommendations to safely attend to demonstrations.**

*To provide practical recommendations on reducing the exposure to COVID-19 during April in the context of the National Strike.*

<https://www.elespectador.com/colombia/mas-regiones/que-hago-si-la-policia-me-detiene-en-medio-de-las-protestas-del-paro-nacional-article/>

# Outreach

## **PROJECT SOCIALIZATION**

### **Fundación Santo Domingo**

#### *To explore collaboration opportunities*

1. *Contact with the Health Secretariat of Manizales and the leaders of the vaccination strategies against COVID-19 in the region*
2. *Contact with the City Planning Secretariat of Barranquilla and the leaders of vaccination strategies against COVID-19 in the region*

### **Así Vamos en Salud**

#### *To obtain technical advisory regarding the pertinence, validity, and appropriateness of the Vaccination Dashboard and understand potential partnerships for deepening the analysis of vaccination logistics.*

1. *Minutes of the meeting that included feedback for the dashboard*
2. *Contact with Fundación Santo Domingo to serve as a link with the vaccination programs of Barranquilla and Manizales*

### **Secretaria de Salud de Bogotá**

#### *To socialize the dashboard: Follow-up to the vaccination process in Colombia*

# Gender approach



## **AI4COVID WORKSHOP**

### **Participation in the workshop**

*To reflect on gender approaches to apply on COLEV*

[https://miro.com/app/board/o9J\\_lEbHuh4=](https://miro.com/app/board/o9J_lEbHuh4=/)

## **TEAM DISCUSSIONS**

### **Pensando el género en COLEV**

*To reflect on gender approaches to apply on COLEV*

*Formulation of research questions per objective around gender:*

<https://padlet.com/nnino581/e7fyf6auox0h4uud>

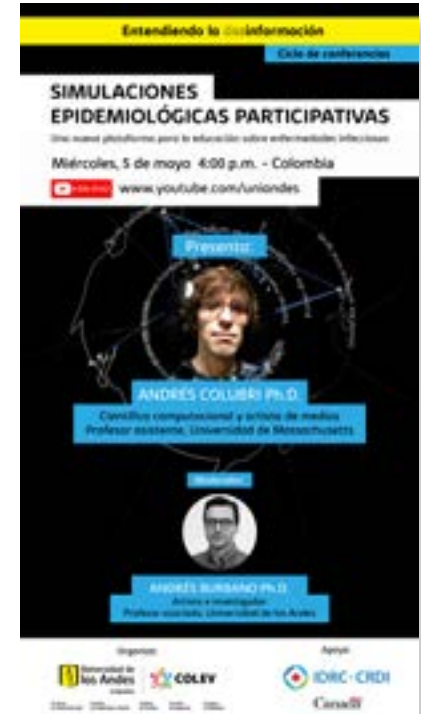
# Events

## ***SIMULACIONES EPIDEMIOLÓGICAS PARTICIPATIVAS:*** **UNA NUEVA PLATAFORMA PARA LA EDUCACIÓN** **SOBRE ENFERMEDADES INFECCIOSAS**

[\*See event video\*](#)

### **Memories:**

[\*See event memories\*](#)



## COLOQUIOS EN SALUD PÚBLICA Y EPIDEMIOLOGÍA PROYECTO COLEV

[See event video](#)

**Memories:**

[See event memories](#)



# Index - June

*Progress by objective*

*Media Appearances*

*Outreach*

*Team Consolidation*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## QUALITATIVE DATA COLLECTION

### Interviews

1. One (1) interviews with developers (total = 14)
2. Two (5) interviews with high-level decision-makers (total = 10)
3. Seven (7) interviews with middle-level decision-makers (total = 27)

## QUALITATIVE ANALYSIS

### Data analysis.

Seven (7) interviews have been analysed (total= 21)

## PARTICIPATION IN PANELS

**Panel: National Plan of Vaccination against COVID-19 - The perspective from the municipalities.**

*To present challenges from the academic sector perspective to decision-makers at the municipal level.*

<https://www.youtube.com/watch?v=CufvpznMiys&t=2583s>



## Objective 2 - COVID-19 Models

### **CASE FORECASTING**

Newspaper note about the upcoming weeks in the pandemic in Bogotá.

*To socialize the most recent results of the forecast for Bogotá.*

<https://elnuevosiglo.com.co/articulos/06-21-2021-contagios-y-fallecimientos-seguiran-aumentando-modelacion-matematica>

### **REPOSITORY WITH DATA FOR WEBPAGE VIZ**

*Github repository with all the forecast-fits and data used.*

[https://github.com/biomac-lab/covid19\\_forecast\\_data](https://github.com/biomac-lab/covid19_forecast_data)



## Objective 3 - COVID-19 and health operations management

### VACCINATION LOGISTICS

#### **Socialization of the dashboard to critical stakeholders**

*To present and validate the interpretability and usefulness of the logistics indicators to critical stakeholders and adjust the dashboard accordingly.*

*Meetings with:*

*C. Erika María Vargas expert from the Vaccination office of the Ministry of Health*

*D. Carlos Humberto Arango - President of the Federation of Departments of Colombia*

*E. Julio Rincón - Director of COSESAM, National Federation of Health Secretariats*

<https://colev.uniandes.edu.co/colev-en-accion/2-uncategorised/58-avance-nacional-de-vacunacion>

#### **Monthly COLEV Report: Follow-up to the COVID-19 vaccination process in Colombia.**

*To present a detailed analysis of selected logistics indicators.*

<https://colev.uniandes.edu.co/en/colev-in-action/14-uncategorised-2/74-boletin-1-vac>



## VACCINATION LOGISTICS

### **Validation of the vaccination process with Barranquilla's health Secretariat.**

*To validate and adjust the graphical representation to specify the vaccination processes according to the reality of the Barranquilla's context using the BPMN language.*

- 1. Meeting with the health secretariat of Barranquilla*
- 2. Validation of the process*

### **On-site observation of the vaccination process.**

*To collect data on-site to obtain the necessary inputs for the vaccination process simulation in Barranquilla, including details such as time per activity, the configuration of the process, and identification of bottlenecks*

**Dataset:** *input of activities timing and bottlenecks for process simulation and future optimization.*



## **NON-COVID-19 EFFECTS OF COVID-19**

### **First approach to Non-COVID-19 effects of COVID-19.**

*To standardize a database about health metrics, since there are multiple sources with interrupted data periods.*

*The team has participated in training sessions to get access to public databases in the Ministry of Health.*



## **INTERNATIONAL COVID-19 VACCINATION PROCESS**

### **Data compilation of vaccination strategies in The Americas and the World.**

*To select the countries to analyze in the paper regarding macro- and meso-level metrics such as GDP or health coverage index.*

*Database in excel with variables and description of COVID-19 vaccination per country*

### **Case of study**

*To write the case of the countries selected, described their strategy and round up some take aways for future vaccination massive programs.*

*First paper draft*

### **Abstract for an International conference.**

*To present the analysis in a conference.*

*Abstract and conference application*



## Objective 4 - Social Media and COVID-19

### ONLINE CONVERSATION REGARDING COVID-19

#### Validation of labeled tweet dataset

*To measure the validity of the tagging of a sample of 1,000 tweets with the following feature classes: vaccination, education, mental health, and domestic violence.*

*Jupyter notebook and Google sheets documents.*

<https://colab.research.google.com/drive/1I3IMlymtjaXb2AKv38rO9nfQuicMaRFv>



## Objective 5 - Dis and misinformation museum

### **DISINFORMATION DATA SET DEVELOPMENT**

**Consolidation of the new dataset.**

*Consolidation of the new dataset with new information, social media data, and meta data of diverse kinds.*

*Museum of Disinformation dataset*

### **DISINFORMATION DATA SET PROCESSING**

**Process the data set with natural language processing machine learning techniques.**

*Understanding of the use of language in the entire dataset.*

*Museum of Disinformation dataset*

**Process the data set with natural language processing machine learning techniques.**

*Identification of trends that develop in time*

*Museum of Disinformation dataset*



## **UN AÑO DE DESINFORMACIÓN**

**Visualization piece developed from scratch about selected fakenews related to Covid-19 during a year in Colombia**

*Communicate visually our insights about disinformation*

*Set of specialized visualizations*

<https://uniandes.edu.co/es/noticias/salud-y-medicina/la-desinformacion-durante-la-pandemia>

## **MEETING UNIVERSITY OF CALIFORNIA SANTA CRUZ**

**Preparation for the visualization and data analysis work that will be conducted with the University of California Santa Cruz.**

*Prepare the collaborative work that we will develop for a year with the Creative Coding Lab lead by professor Angus Forbes.*

*International research collaboration*



# Media Appearances

## **NATIONAL NEWSPAPER**

**Analysis of the epidemiological situation in Colombia.**

*To present an interdisciplinary analysis for the general public about the current epidemiological situation of Colombia: The analysis included results from the forecasting, analysis of the COVID19 vaccination from a logistic point of view, and a general analysis of the situation.*

<https://www.elespectador.com/salud/por-que-estamos-aca-en-este-punto-de-covid-19/>

## **LOCAL (BOGOTÁ) NEWSPAPER**

**Newspaper note about the upcoming weeks in the pandemic in Bogotá.**

*To socialize the most recent results of the forecast for Bogotá.*

<https://elnuevosiglo.com.co/articulos/06-21-2021-contagios-y-fallecimientos-seguiran-aumentando-modelacion-matematica>

# Outreach



## **PROJECT SOCIALIZATION**

### **General audience**

*To socialize the COLEV Vaccination Dashboard*

<https://uniandes.edu.co/es/noticias/salud-y-medicina/visualizador-de-datos-sobre-vacunacion-en-colombia>

*To socialize the mis and disinformation museum.*

<https://uniandes.edu.co/es/noticias/salud-y-medicina/la-desinformacion-durante-la-pandemia>

# Gender approach



## **MEETINGS WITH LADYSMITH**

### **Knowing each other**

*To understand Ladysmith's work, context, and experience and to express the needs of COLEV around applying gender approaches in our research.*

- 1. Start a support relationship with Ladysmith .*
- 2. Literature provision on the topic and practical examples of how to apply gender approaches to AI and data science projects.*



# Team Consolidation

## New team members



*Denis Toledo Vargas*  
*Designer*



*Hugo Felipe Idarraga*  
*Artist, developer and web programmer*

# Index - July

*Progress by objective*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## **QUALITATIVE ANALYSIS**

### **Data analysis.**

*To analyse interviews using the software NVivo*

*Fourteen (14) interviews were coded and analysed (Total=35)*

### **Data Collection**

*To conduct ethnographic work related to vaccination*

*The team conducted fieldwork in the city of Manizales for four days. Three vaccination points were observed.*



## Objective 2 - COVID-19 Models

### **CODE WRITING AND MODEL IMPLEMENTATION**

**To write and implement a new version of the school reopening model to be implemented as a tool for decision making.**

*This model will be implemented on a interface to be used fo user and calculate their impact.*

[https://github.com/biomac-lab/COVID\\_schools\\_dashboard](https://github.com/biomac-lab/COVID_schools_dashboard)

### **INTRA-GROUP MEETING**

**To meet with Juan Camilo and Hugo (COLEV)**

*Generation and design of a tool for school reopening*

*With Juan Camilo González and Hugo Idarraga we have started generating an interface to make the school reopening a user friendly tool to calculate the risk*

[https://github.com/biomac-lab/COVID\\_schools\\_dashboard](https://github.com/biomac-lab/COVID_schools_dashboard)



## **MODEL FORMULATION AND ANALYSIS**

**To write model scripts and model running.**

*This activity generated a model that analyze the efefct of sparring the doses for the Pfizer vaccines*

*We generated results for the ministry of health wich help to support the decision of extend the time between doses for the Pfizer vaccione.*

## **PAPER WRITING**

**To write a draft of a paper evaluating the rotating lockdowns scheme in Bogota.**

*We finalyzed the analyses and started to write the paper to be submitted to a journal*

*We will produce a draft of a paper to be submitted in a journal by september.*

## **RESULTS REPORT WRITING**

**To write a report of the parameter inference exercise with a model with age classes for the 10 biggest cities in the country**

*Writing a report of the results showing the estimates by age in the 10 biggest cities of the country*

*We will produce a report describing the methods and showing the results obtained from the parameter inference exercise*



## Objective 3 - COVID-19 and health operations management

### VACCINATION LOGISTICS

**Monitoring of the national vaccination process by departments.**

*Thinking in gender, we created the first version of our dashboard title: “COVID-19 vaccination logistic - COLEV - Uniandes”, however, after that, we have placed two tabs more. The first one is about gender, for which, there you can find the demography in vaccination, which is composed by Colombian population to immunize. On the second one, you can be informed about “ No-COVID-19 effects” which are really important for making decisions.*

*Two new tabs on the dashboard proposed.*

*Newsletter of the Colombian COVID-19 vaccination process in June 2021.*

<https://datastudio.google.com/s/qxmFoTyiN3Y>



## VACCINATION PROCESSES

### Taking times in COVID-19 vaccination processes.

*Field visits: Firstly, a team of four people visited three COVID-19 vaccination points in Barranquilla (Atlántico) in order to take times of the COVID-19 vaccination process. Secondly, the same team, but now it was composed by five people visited four COVID-19 vaccination points in Manizales (Caldas). To sum up, the two Colombian cities were visited in order to make a comparative analysis of the vaccination points using BPM simulation tools.*

*Data analysis of distributions functions per activity of COVID-19 vaccination process.*



## **MENTAL HEALTH**

### **Data Collection mental health during COVID-19.**

*We identified some problematics around mental health due to COVID-19. Therefore, we are collecting data from government health database.*

*Data collection of government health database.*



## Objective 4 - Social Media and COVID-19

### **A YEAR OF COVID-19**

#### **Collection of every tweet related to COVID-19 in 2019 and 2020**

*To collect every original tweet regarding COVID-19 in Colombia between December 2019 and December 2020.*

*We will perform topic modelling using latent Dirichlet allocation (LDA), non-negative matrix factorization (NNMF), and hierarchical Dirichlet process (HDP) in order to describe the underlying language semantics in one year of COVID-19 online chatter.*

### **ADVISOR MEETINGS**

#### **As-needed meetings with advisors**

*To foster a healthy academic discussion regarding NLP and social media with key academics, professors, and data scientists*

*Occasional meetings with Ruben Manrique, NLP professor in the Engineering Department at Universidad de los Andes. These meetings were focused on the construction of the labeled tweet dataset.*



## **GENDER-DIFFERENTIATED DATA**

### **Identification of gender-differentiated datasets**

#### *To identify gender-differentiated sources of data for social media analysis*

*Given how a focus on gender is transversal for COLEV, it was necessary to identify how our research could benefit from and include academic gender frameworks. A first step is to identify the availability of gender-differentiated data. However, publicly available social media posts and accounts are usually devoid of demographic information.*

## **INTRA-GROUP MEETING**

### **Meeting with Juan Camilo and Hugo (COLEV)**

#### *To begin working with Juan Camilo and Hugo for automatization and visualization support*

*Incipient working relationship with Juan Camilo and Hugo for support regarding 1) automatization of several steps in the data pipeline, 2) creation of compelling visualizations, and 3) use of remote servers for batch, near-to-real-time, and real-time storage and computation.*



## **OBSERVATORIO DE CIENCIA Y TECNOLOGÍA (OCyT)**

### **Academic cooperation with the Science and Technology Observatory (OCyT)**

*To establish an academic cooperation with the OCyT in order to further current and future research.*

*Several meetings with the OCyT that resulted in the formation of an inter-institutional team of researchers focused on leveraging the strengths and experience of Universidad de los Andes and OCyT.*

## **CODE UPDATE**

### **Update of Python scripts**

*To update our programming scripts in order to include MongoDB integration and seamless Twitter API queries*

*The tweet objects given by the Twitter API are JSON-like objects that are better stored in non-relational document systems such as MongoDB. We updated our code in order to 1) integrate automatic I/O with MongoDB Atlas, a secure cloud database management system, and 2) perform seamless queries via custom-made functions.*



# Objective 5 - Dis and misinformation museum

## **BAG OF WORDS OF DISINFOMATION SKETCHES**

### **Dynamic Visualization Sketches**

*Explore dynamic ways to represent disinformation visually*

*Museum of Disinformation visualization*

<https://public.flourish.studio/visualisation/6594465/>

<https://public.flourish.studio/visualisation/6595462/>

## **STORYTELLING AND TIMELINE OF THE CHIP-VACCINE ISSUE**

### **Narrative-based Sketches**

*Explore narrative storytelling strategies to tell the stories of disinformation*

*Museum of Disinformation visualization*



**LOGISTICS TO FACILITATE THE WORK WITH THE UCSC FIRST GRADUATE STUDENT. IT IS POSSIBLE THANKS TO FUNDS FROM 100K NEXO GLOBAL PROJECT.**

**Preparation for the visualization and data analysis work that will be conducted with the University of California Santa Cruz.**

*Iniciate the collaboration with the team at UCSC*

*International research collaboration*

**FIRST VERSION OF THE PROPOSAL OF DISINFORMATION FOR SCHOOLS**

**Proposal for a disruptive disinformation initiative for high schools in Bogotá**

*Educate about disinformation*

*Museum of Disinformation communication strategy*

# Index - August

*Progress by objective*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 2*

*Objective 5*

*Objective 3*



## **QUALITATIVE ANALYSIS**

### **Data analysis.**

*To analyse interviews using the software NVivo*

*Fourteen (14) interviews were coded and analysed (Total=35)*

### **Data Collection**

*To conduct ethnographic work related to vaccination*

*The team conducted fieldwork in the city of Manizales for four days. Three vaccination points were observed.*



## Objective 2 - COVID-19 Models

### **INTRA-GROUP MEETING**

#### **Meeting with Juan Camilo and Hugo**

*To continue working in the forecasting visualization tool.*

*Generate a dashborad with the results of the weekly forecast generated by the team since the begining of january*

#### **Meeting with Juan Camilo and Hugo**

*To continue woking in the school risk reopening tool.*

*We have generated a tool to evaluate the school reopening risk to be used by parents and school principals*



## **MODEL FORMULATION AND ANALYSIS**

### **Code writing and simulation.**

*To improve and incorporate new aspect of the school reopening model.*

*We have generated a github repository with the codes of the model and the results of the simulations*

[https://github.com/biomac-lab/COVID\\_schools\\_dashboard](https://github.com/biomac-lab/COVID_schools_dashboard)

## **PAPER RESUBMISSION**

### **Addressing journal reviews.**

*To resubmit a paper to scientific report about the forecasting exercise.*

*We have resubmitted the manuscript about forecasting to scientific reports.*



## **Objective 3 - COVID-19 and health operations management**

### **VACCINATION LOGISTICS**

**Identification of opportunities for establish policies in Colombian vaccination process.**

*To characterize guidelines that the ministry of health, secretaries of health and other governmental entities interested should apply in the Colombian process vaccination.*

*Three policy briefs were written:*

- 1) The first one is about the platforms that the country needs, because we found inconsistencies in accessibility and in the information uploads (delays).*
- 2) The second one is about the inventory that has been generated by several factors; is it good or bad?*
- 3) Work overload in COVID-19 vaccination points.*

**Monthly divulgation of advance in COVID-19 vaccination.**

*To inform the health ecosystem the monthly status of Colombian progress in vaccination.*

*Daily update of the logistic dashboard on vaccination.*



## VACCINATION LOGISTICS

### **Divulagation of outcomes.**

*To present our outcomes, there was written an extended abstract, which was titled: Multi-level learning from COVID 19 vaccination for the design and implementation of future massive programs.*

*Extended abstract written and sent, which is titled: Multi-level learning from COVID19 vaccination for the design and implementation of future massive programs.*

### **Input analysis of data obtained from vaccination points visited in previous months (Barranquilla y Manizales).**

*To discover data behavior using probability distribution functions in Arena software.*

*A document with the input analysis of distribution functions of data obtained from the vaccination points visited in previous months (Barranquilla y Manizales).*

## MENTAL HEALTH - MENTAL DISORDERS

### **Identification of non COVID-events (anxiety, depression, self-inflicted injuries).**

*To identify non COVID-events (anxiety, depression, self-inflicted injuries) from Individual Records of Provision of Services (by its acronym in Spanish: RIPS).*

*To show behaviour in Colombia about non COVID-19 events, we are building a dashboard.*



## Objective 4 - Social Media and COVID-19

### QUESTIONS AND DISINFORMATION IN SOCIAL MEDIA

**Identification of questions, doubts, and disinformation found in social media analysis.**

*To make a catalog of questions, doubts, and disinformation topics found as a result of the analysis of Twitter and Facebook. This catalog will be useful to orient educational activities by O3.*

*Catalog of questions, doubts, and disinformation topics found in social media.*

### MIGRANTS AND COVID-19

**Meetings with OIM.**

*To find common grounds with OIM regarding migrants and social media. We had several brainstorming sessions and decided to begin making exploratory queries in Twitter and Facebook about migrants and COVID-19.*

- Literature review to inform the selection of keywords for queries.*
- Results of exploratory queries about xenophobia, vaccination, and disinformation among migrant population in Colombia.*



## **INTRA-GROUP MEETING**

### **Meeting with Juan Camilo and Hugo (COLEV).**

*To define a workplan for data visualization and automatization.*

- Objective 4 - Juan Camilo and Hugo workplan.
- Definition of variables and fields.
- Text summary of analysis logic.

### **Meeting with Mauricio (O2).**

*To continue working on correlations between social media and pandemic metrics.*

*Frequency time-series from: general COVID-19 query and individual COVID-19 signs and symptoms.*



## Objective 5 - Dis and misinformation museum

### **MISINFORMATION ANALYSIS**

**5G, COVID-19 and the famous chip that never existed.**

*Identify the presence and evolution of the 5g conspiracy theory in Colombia.*

*A visualization of the research.*

# Index - September

*Progress by objective*

# Progress by objective

*Objective 1*

*Objective 3*

*Objective 4*



## QUALITATIVE ANALYSIS

### Data analysis.

*To analyse the heaviest codes created in Nvivo of 49 interviews.*

*Three main codes are now being analyzed*

- 1) Enablers and barriers to access data.*
- 2) Narratives about the data and data science.*
- 3) Evidence needs and preferences. -*

*To develop reports about the main findings of the three heaviest codes in NVivo*

*Three reports are now written consolidating the main findings of three key codes of Nvivo.*

### Meetings with OB 4

*To plan a inter-objective colaboration to develop a network analysis of the vaccination plan in Barranquilla*

*Draf of a research desing oriented to develop a network analysis of the vaccination plan in Barranquilla.*



## Objective 3 - COVID-19 and health operations management

### VACCINATION PROCESSES

**Taking times in points of COVID-19 vaccination for making decision in this process.**

*To built an database of times of COVID-19 vaccination process, and to analyse of its distributions functions per activity.*

*To search articles to write a literature review about simulation processes in COVID-19 vaccination.*

### VACCINATION LOGISTICS

**Monitoring of the national vaccination process by departments.**

*To analyse the advance in COVID-19 Colombian Vaccination Process and its impact by sex.*

- Draft of article about logistics indexes.
- Draft of policy brief about inventory in the COVID national vaccination.

<https://datastudio.google.com/s/qxmFoTyiN3Y>



## **MENTAL HEALTH**

**Data collection of mental health during COVID-19.**

*To collect and analysis of government health database.*

*To bulid a dashboard about mental health, and search articles for writing a literature review about depression and anxiety.*

<https://datastudio.google.com/reporting/a8704210-dca2-494c-83ec-97dcb369c97d>



## **Objective 4 - Social Media and COVID-19**

### **INTRA-GROUP MEETING**

#### **Meetings with O4**

*To plan an inter-objective collaboration for a network analysis of the vaccination plan in Barranquilla*

*Draft of the research paper*

#### **RIPS and mental health w/ Sandra**

*To talk and brainstorm about the pros and cons of RIPS for estimating mental health morbidity and mortality in Colombia*

*Benefits and limitations of RIPS as well as a critique on closed-population methods for estimating under registration*

#### **Working meeting with O5 and Observatorio de Democracia**

*To establish the work plan for the sources, design, and timeline for the media pieces to be used in COVIDA-2*

*Workplan by O5*



## INTRA-GROUP MEETING

### COLEV communications team

*“Several meetings with COLEV’s communications teams to:*

- give feedback about upcoming group communications strategy*
- identify and define target audiences and outputs”*

*Target audiences were clearly identified for O4, as well as their corresponding outputs and priorities*

## QUANTITATIVE ANALYSIS

### User characterization

*To calculate new metrics based on popularity, reach, and engagement from the users in our datasets*

*Weighted log-transform metric*

### Description of most frequent topics in the online conversation between April and August/2021

*To identify and show the most frequent topics of conversation in this time period. In addition, we had several meetings with COLEV researchers and MinSalud, as well as media outlets to fine-tune the delivery. Currently, working on a graphic policy brief.*

*Document available in the Dropbox. Shared with COVIDA-2 and MinSalud. Policy brief message box already filled out.*



## **GENDER**

### **Gender@Work and AI4COVID peer event**

*To share insights and experiences about including gender as a focal lens in our research within COLEV with our peer AI4COVID grantees*

*Several points of contact with other research groups (Nigeria, Kenya, and Malawi) and scheduled follow up meetings to discuss future collaborations*

## **SOCIAL MEDIA QUERIES**

**Translation, categorization, and definition of queries for: 1) COVID-19, 2) drugs, 3) signs and symptoms, 4) organizations, 5) medical procedures, 6) vaccination, 7) viral aspects, 8) and biosafety measures.**

*To construct the queries that will be used for calculating frequency time series and other metrics to cross-analyze with data from O2.*

*“Excel file available in Dropbox:*

- Sheets are categories*
- Rows are keywords”*



## **TOPIC MODELING ABSTRACT**

### **Social media topic modeling from 2019-12 to 2021-06**

*To write an abstract about the topic modeling performed on social media data from december 2019 to june 2021.*

*Abstract available in Dropbox. Sent to the XVII Encuentro Científico del INS.*

# Index - October

*Progress by objective*



# Progress by objective

*Objective 1*

*Objective 4*

*Objective 3*

*Objective 5*



## QUALITATIVE ANALYSIS

### Data Analysis

*To analyze emerging categories coming from the heaviest codes of the analysis of 49 interviews.*

*An excel document and a Miro document consolidating relationships between primary codes and emerging categories.*

### Meetings with OB 4 and Diana Higuera

*To plan the development of a network analysis of the vaccination plan in Barranquilla in which a student of the master of public health will be involved.*

*We planned the main activities we need to achieve to define main actors of the network.*

### Findings presentation

*To develop an abstract and a presentation for a conference hosted by the Medicine School of Universidad de los Andes called “VI Encuentro Conjunto de Investigadores” on the 4th of September.*

*We developed a video with the presentation “Barriers to access health data and inter-institutional collaboration: An analysis in the context of COVID-19 in Colombia” that was included in the conference.*



## Objective 3 - COVID-19 and health operations management

### VACCINATION LOGISTICS

**Monitoring of the national vaccination process by departments.**

*To analyse the advance in COVID-19 Colombian Vaccination Process.*

*A working paper about logistics indexes and its monitoring.*

<https://datastudio.google.com/s/qxmFoTyiN3Y>

**Disemination of results, abstract: “Multi-level learning from COVID19 vaccination for the design and implementation of future massive programs”**

*To present in a conference the results obtained of the comparative study of the COVID19 vaccination strategies, and national vaccination plan in the Americas using a multi-level perspective.*

*The work was submitted to WOSC and the work was presented on the virtual conference. The paper is entitled “Multi-level learning from COVID19 vaccination for the design and implementation of future massive programs”.*

<https://www.wosc2020.org/programme>

*page 5; Tuesday, 28.9.2021; 14:40 15:00*



## VACCINATION PROCESSES

**Writing about efficiency at COVID-19 vaccination points.**

*To establish several scenarios about improving of COVID-19 vaccination process, to recommend some best practices in the process and for making decisions*

*Simulation data and proposed scenarios. Recommendations to improve efficiency at COVID-19 vaccination points.*

*Se hicieron informe de seguimiento diario, se adjuntan las bitácoras*

## MENTAL HEALTH

**Data collection of mental health during COVID-19.**

*To collect and analyze information from official data sources for mental health events, particularly anxiety, depressions, and sleep disorders. To adjust a forecasting model for predicting future behaviors.*

*The intermediate products will be (1) the forecast model, (2) the analysis developed from the model*

*Final outcome: Paper with the forecasting model, that allows evaluating the impact of COVID-19 on mental disorders during 2021.*

<https://datastudio.google.com/reporting/a8704210-dca2-494c-83ec-97dcb369c97d>



## **VACCINATION IN THE FIELD**

### **Academic support regarding the selection of the local provider**

*To assist the process to select the health institution that would perform the vaccination process in the CoVIDA project.*

*Selection of the health provider in charge of the vaccination process in the CoVIDA project.*

[https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p\\_kdpfyzh5nc](https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p_kdpfyzh5nc)



## **Objective 4 - Social Media and COVID-19**

### **TOPIC MODELING**

#### **Creation of topic modeling poster for the INS event**

*To design a poster showing the results of the topic modeling of tweets between January 2019 and September 2021*

*The poster was uploaded and is going to be presented in the XVII Encuentro Científico del INS. It can also be found on the Objetivo 4 “Topic Modeling” folder in Dropbox.*

#### **Creation of the topic modeling paper outline and draft**

*To draft the outline of the paper showing the results of the topic modeling of tweets between January 2019 and September 2021.*

*The paper is still a draft but will be finished shortly. We are reviewing candidate peer-reviewed journals for submission.*



# Objective 4 - Social Media and COVID-19

## QUESTIONS AND MISINFORMATION IN SOCIAL MEDIA

### Policy Brief

*To finish the final edits of the policy brief and proofread based on content, appearance, and interactivity.*

*We finished the questions and misinformation in social media policy brief with the unflinching support of Diana Higuera and the communications team at COLEV.*

<https://colev.uniandes.edu.co/resultados/22-colev-en-accion/186-temas-y-preguntas-que-han-persistido>

## SOCIAL MEDIA AND IMMIGRANT POPULATION

### Twitter query design and dataset creation

*To design the search query using appropriate keywords and boolean logic.  
To collect the relevant tweets using the chosen query strategy.*

*We finished the questions and misinformation in social media policy brief with the unflinching support of Diana Higuera and the communications team at COLEV.*

<https://colev.uniandes.edu.co/resultados/22-colev-en-accion/186-temas-y-preguntas-que-han-persistido>



## VISUALIZATION

### Real-time visualization of metrics and graphs

*To define a workflow to develop a dashboard that shows real-time metrics of interest from Twitter and Facebook*

*We met with Hugo to define next steps and a schedule to work on the development of the dashboard. also be found on the Objetivo 4 “Topic Modeling” folder in Dropbox.*

## MEETINGS WITH OTHER AI4COVID GRANTEES

### Meeting with Kenya team

*To share insights, experiences, and feedback about social media analyses with other AI4COVID grantees.*

*We met with Zahra and Dr. Kong from the Kenya team to discuss methodologies and findings related to social media analysis. We agreed to further meetings to keep discussing results and sharing feedback.*



## Objective 5 - Dis and misinformation museum

### **5G CHIP AND DISINFORMATION**

#### **Narrative-based in ScrollingTelling**

*Explore narrative storytelling strategies to tell the stories of disinformation.*

*Museum of Disinformation visualization -Github.*

# Index - November

*Progress by objective*

# Progress by objective

*Objective 1*

*Objective 3*



## **QUALITATIVE ANALYSIS**

### **Map of actors**

*To characterize the health ecosystem.*

*The map of actors was validated with the director of the Observatory of Health of Bogotá and her team. The map was also socialized with the Director of the National Institute of Health. The recommendations made by these actors were incorporated in the map of actors.*

### **Interviews**

*To collect interviews with stakeholders.*

*Two interviews with stakeholders were conducted.*

### **Publication design**

*To outline the findings of a publication on data access.*

*List of interviews and codes of Nvivo that will be used for the analysis.*



## **Objective 3 - COVID-19 and health operations management**

### **VACCINATION IN THE FIELD**

#### **Academic support regarding the selection of the local provider**

*To assist the process to select the health institution that would perform the vaccination process in the CoVIDA project.*

*Selection of the health provider in charge of the vaccination process in the CoVIDA project.*

#### **Academic support regarding the selection of the best locations to be vaccination points**

*To select the optimal location for vaccination using logistics and health criteria.*

*Vaccination points.*

#### **Primary data collection**

*To gather data about the vaccination process in each point using the same variables of the Bogotá's secretariat of health*

*CoVIDA Dashboard: Includes the descriptive analysis of logistics indicators, and vaccination rates in each point*

[https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p\\_kdpfyzh5nc](https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p_kdpfyzh5nc)

# Index - November

*Progress by objective*

# Progress by objective

## *Objective 3*



## Objective 3 - COVID-19 and health operations management

### **VACCINATION IN THE FIELD**

#### **Academic support regarding the selection of the local provider**

*To assist the process to select the health institution that would perform the vaccination process in the CoVIDA project.*

*Selection of the health provider in charge of the vaccination process in the CoVIDA project.*

#### **Academic support to optimize the vaccination process in each of the selected points**

*To optimize the vaccination process using simulation models and primary collected data.*

*Daily recommendations regarding to optimize the vaccination times in each point.*

[https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p\\_kdpfyzh5nc](https://datastudio.google.com/u/0/reporting/6682d493-3d10-4624-bc03-38e716a42e33/page/p_kdpfyzh5nc)

# Index - January 2022

*Progress by objective*

# Progress by objective

*Objective 1*

*Objective 3*

*Objective 4*



## QUALITATIVE ANALYSIS

### Data Analysis

*To analyse three interviews collected in december 2021.*

*Three interviews (one with a decision maker and 2 with developers) were coded and analysed.*

*To analyze clusters of interviews and review data related to data access, communciation needs, preferences and interactions with decision makers.*

*We reviewed the data of decision makers (n=15 interviews) and generated a matrizz of data that will be used for a publication.*



## Objective 3 - COVID-19 and health operations management

### QUANTITATIVE ANALYSIS

#### Data analysis

*To develop a multivariate analysis that allows to identify the macro variables that impacted the countries performance in COVID-19 vaccination.*

*Clusters of countries, grouped by their similarities according to economic, social, and demographic variables.*



# Objective 4 - Social Media and COVID-19

## QUESTIONS AND MISINFORMATION IN SOCIAL MEDIA

### Policy Brief

*To finish the final edits of the policy brief and proofread based on content, appearance, and interactivity.*

*We finished the questions and misinformation in social media policy brief with the unflinching support of Diana Higuera and the communications team at COLEV.*

<https://colev.uniandes.edu.co/resultados/22-colev-en-accion/186-temas-y-preguntas-que-han-persistido>

## SOCIAL MEDIA AND IMMIGRANT POPULATION

### Twitter query design and dataset creation

*To design the search query using appropriate keywords and boolean logic.*  
*To collect the relevant tweets using the chosen query strategy.*

*We created 7 new datasets that correspond to 7 query strategies using COVID-19, migration, and Venezuelan keywords.*

<https://www.dropbox.com/sh/8a44oia3mgw2xk0/AADiLZ4qGstvarmUZM4h47DYa?dl=0>



## ROBOTIC ACTIVITY IN SOCIAL MEDIA

### Dataset generation

*To finish the R code to include: appropriate data cleaning and preparation, prediction of robotic activity score for each user in the COVID-19 dataset.*

*We finished the R markdown file and collected more than 7 million posts of user timelines. This information will be used to predict robotic activity for the users included in the COVID-19 dataset.*

<https://www.dropbox.com/sh/v0onx9n284p0dkf/AACVanqFe2v6vWR0j0ACTLLqa?dl=0>

# Index - February 2022

*Progress by objective*

# Progress by objective

*Objective 1*

*Objective 2*

*Objective 3*



## QUALITATIVE ANALYSIS

### Map of actors

*To characterize the health ecosystem.*

*The map of actors was adjusted following the recommendations of some of the members of COLEV. Along with the communications team we developed the text that will be guiding the users in our webpage.*



## Objective 2 - COVID-19 Models

### QUANTITATIVE ANALYSIS

#### Data analysis

*To finish the analysis corresponding to the manuscript identifying the mechanisms behind the success of the quarantine schemes implemented in Bogota*

*We have finished the figures identifying the factors that explain the success or not of the lockdown scheme implemented in Bogota*

*To advance in the generation of the results for the manuscript oriented to describe the interactions with decisions makers and how models could be used for these purposes*

*We are running simulations and generating figures with the different outputs generated in different times of the pandemic for decision making*

#### Modeling seroprevalence and vaccination

*To advance in the parameter estimation to determine what was the contribution of natural infection or vaccination in reducing the infections in Colombia and how those patterns vary by age and spatially.*

*We fitted the models to the case, hospitalized and deaths before and after vaccination*



## Objective 2 - COVID-19 Models

### **MANUSCRIPT REVISION**

#### **Addressing journal reviews**

*To finalize the review process of the manuscript submitted to scientific reports.*

*We have addresses the comments suggested for te reviews and resubmitted the paper title: ""*



# **Objective 3 - COVID-19 and health operations management**

## **VACCINATION LOGISTICS**

### **Final Newsletter**

*To analyze the whole progress of PNV to 31st December, the date that was fixed by the national government as the deadline to accomplish the goal of fully vaccinating 70% of the Colombian population. The balance includes logistics KPI, which allows identifying PNV strengths and weaknesses.*

*Based on the vaccination dashboard, we developed an interactive report that provides an analysis of the progress during 2021 of vaccination against COVID-19. This report was shared with decision-makers and the population in general.*

<https://colev.uniandes.edu.co/resultados/2-uncategorised/58-avance-nacional-de-vacunacion>

### **Submission of an Extended Abstract to IFAC conference**

*To organize in an academic document the process of designing, developing and maintaining the COVID-19 vaccination dashboard.*

*An extended abstract that was submitted to IFAC conference and will be the based of a journal paper.*

[https://www.ifac-control.org/conferences/@@conference\\_view](https://www.ifac-control.org/conferences/@@conference_view)

# ¡Thanks!



<https://colev.uniandes.edu.co/>



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