

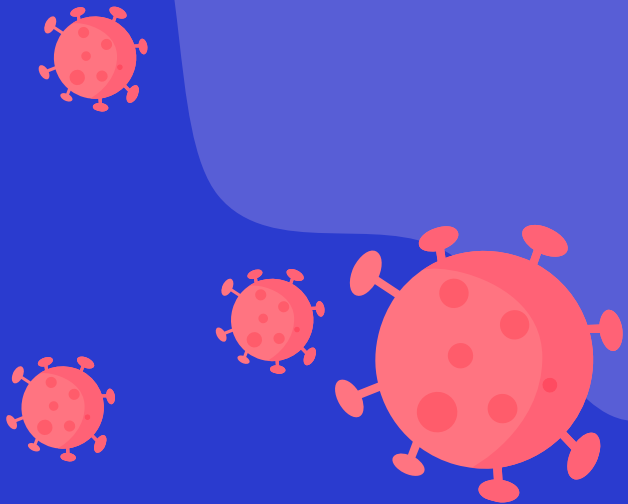
Ανοικτά δεδομένα στη μάχη κατά της πανδημίας Covid-19

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Ηλεκτρολόγος Μηχανικός & Μηχανικός Υπολογιστών

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COVID-19
Response Greece



COVID-19 Response Greece

An *open community of volunteers* with scientific and technological backgrounds, providing services through:



Solutions

Research and design of practical solutions to overcome crucial challenges posed by the pandemic.



Open

Open designs, open access, alternative design solutions available free of charge. We are not in it to make a profit.



Immediately

Immediate response, rapid mobilization, concerted effort.

COVID-19 Response Greece



270

Volunteers

8

Projects

21

Organizations

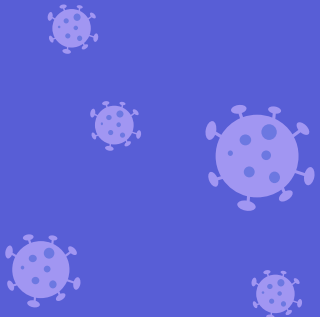
The **idea** behind

Project “Data Analytics”

The Greek situation in March 2020



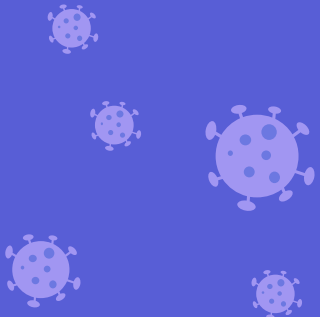
- First Covid-19 reported cases in Greece
- Panic ↔ Misinformation
- Only a few general data available
- Data scattered across WWW, no particular organization or structure



Covid-19: The role of Open Data



- Accelerating research and scientific analysis of a dynamic threat
- Understanding its social and economic impact
- Enabling civil society oversight and reporting
- Enabling data-driven decisions



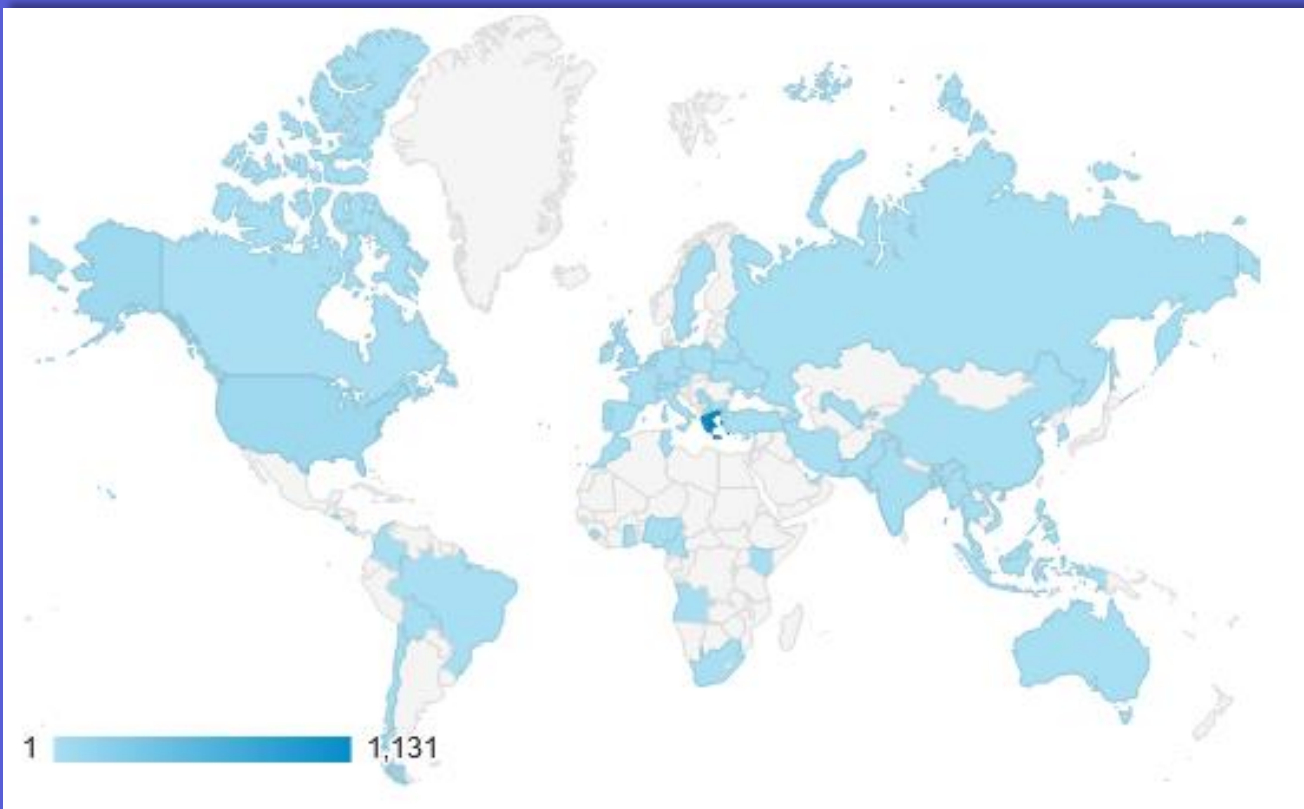
Project “Data Analytics”

Goals:

- ✓ Collect data on the spread of COVID-19 in Greece from various sources
- ✓ Build an organized and up-to-date open database that is available for public use
- ✓ Facilitate research by providing data through an easy-to-use API

Coronavirus Greece API

A simple and fast API for tracking the Coronavirus outbreak in Greece

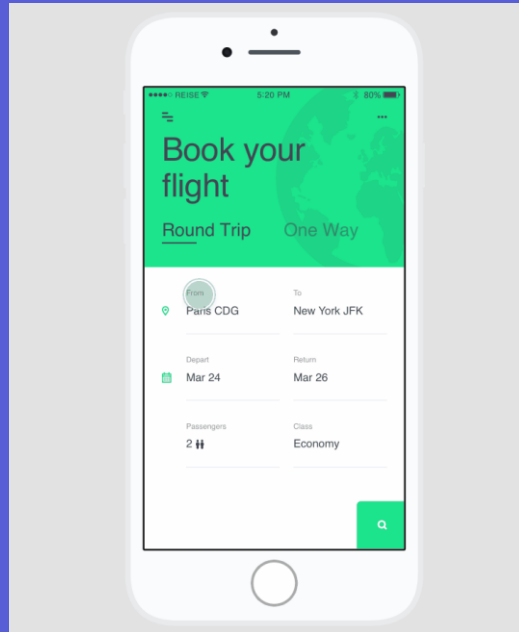


API Usage per Country

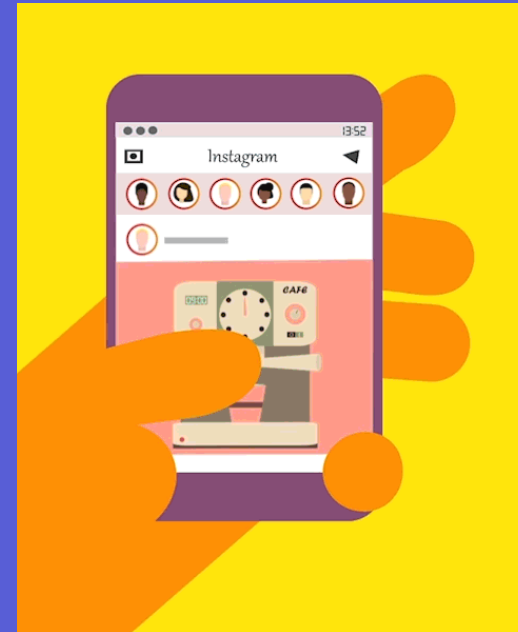
- Provides a plethora of near real-time data concerning the Covid-19 outbreak in Greece for public use
- Used by renowned academic institutions of Greece for research purposes
- Used by developers worldwide

<https://covid-19-greece.herokuapp.com>

What is an API?



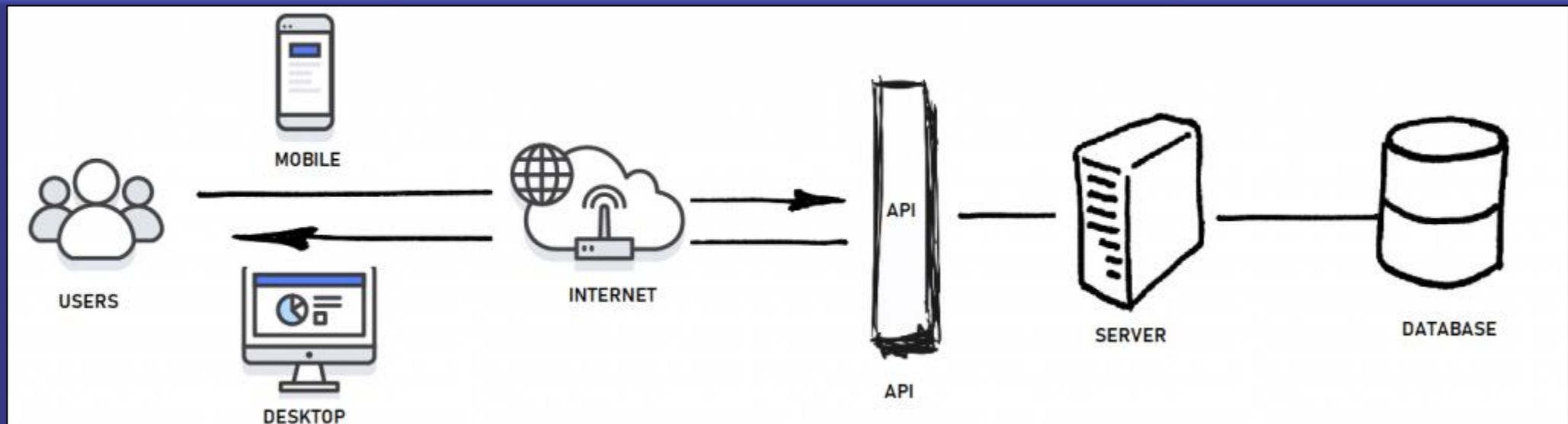
Booking a flight



Social Media

What is an API?

- API stands for **A**pplication **P**rogramming **I**nterface
- A software intermediary that allows two applications to talk to each other
- We will focus on the Web APIs



What is an API? - A familiar analogy

Hungry Customer



Request



Waiter



Response



Kitchen



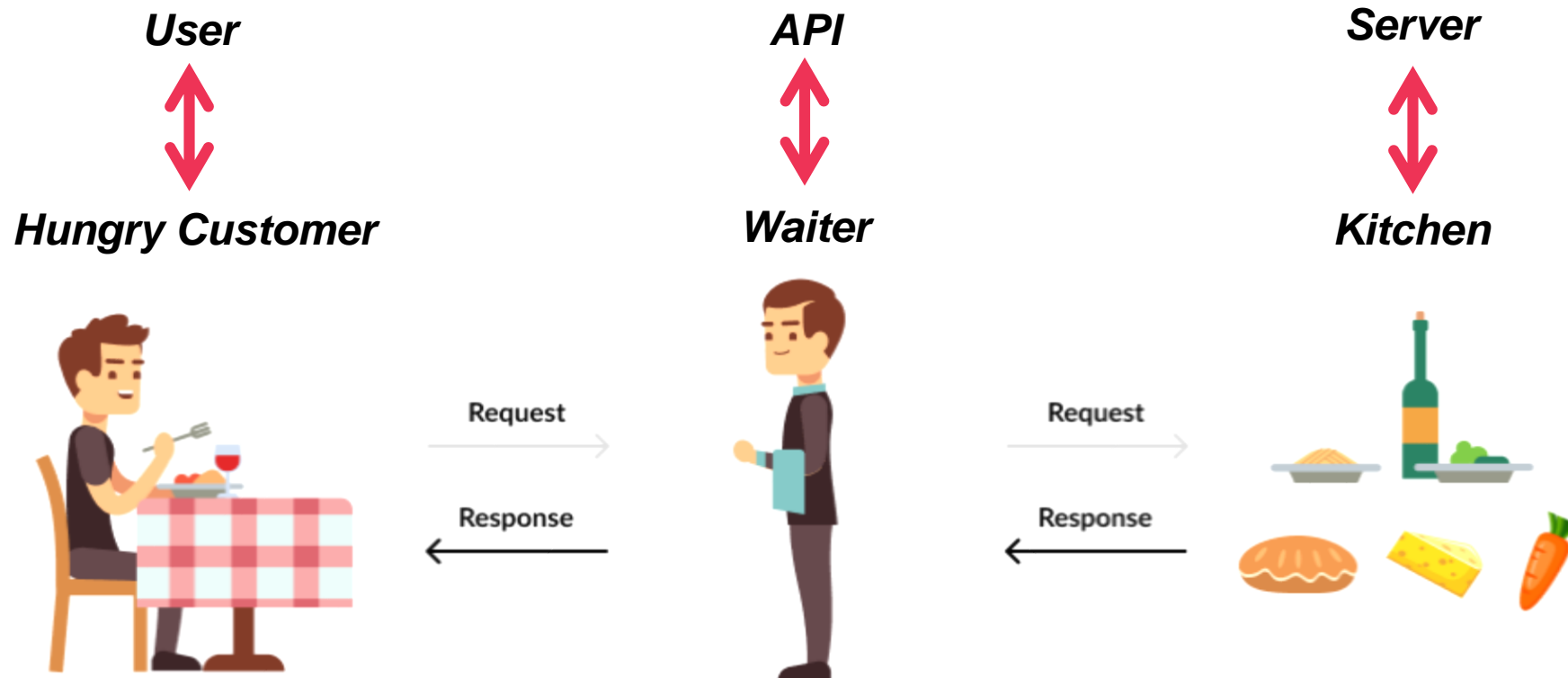
Request



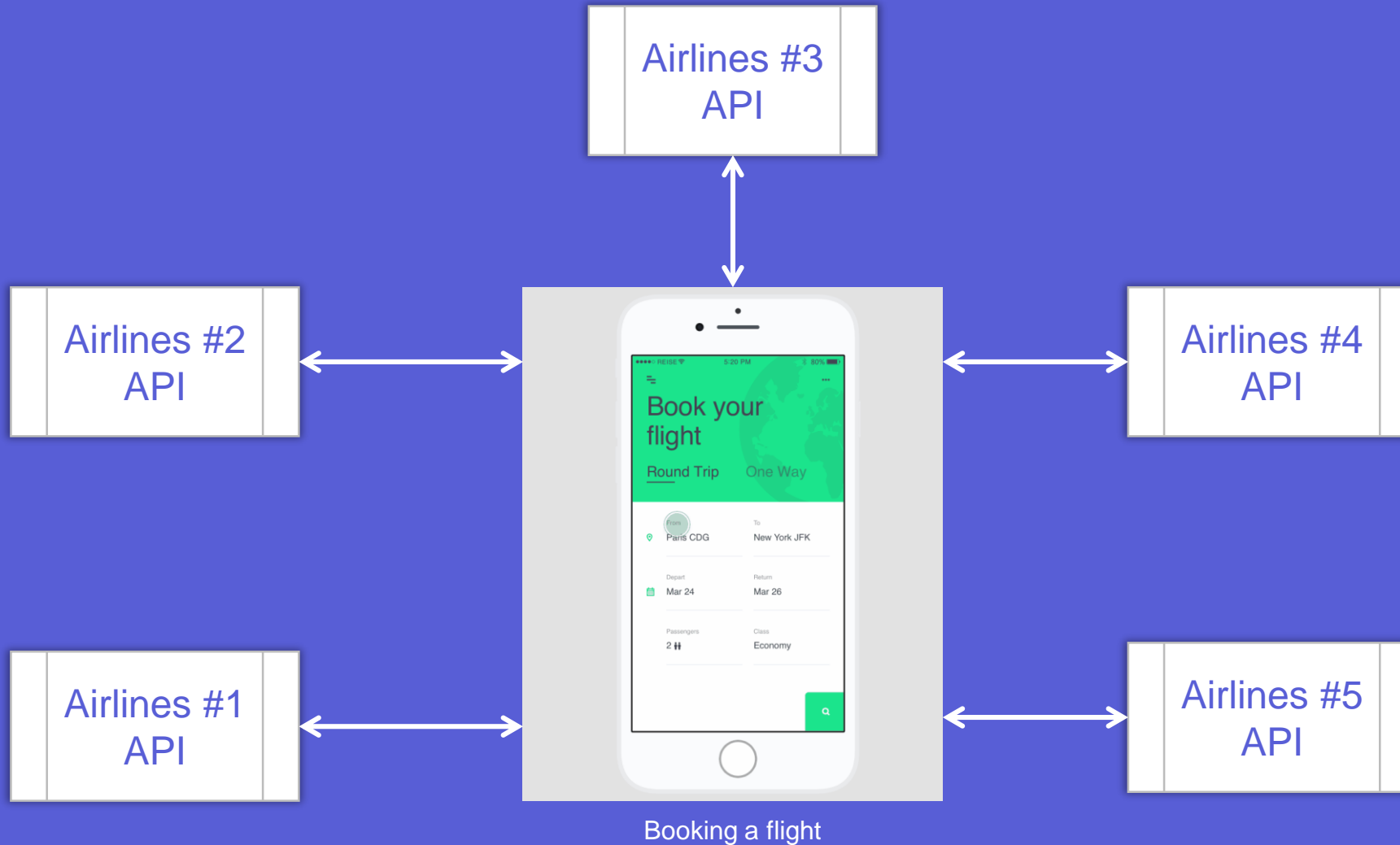
Response



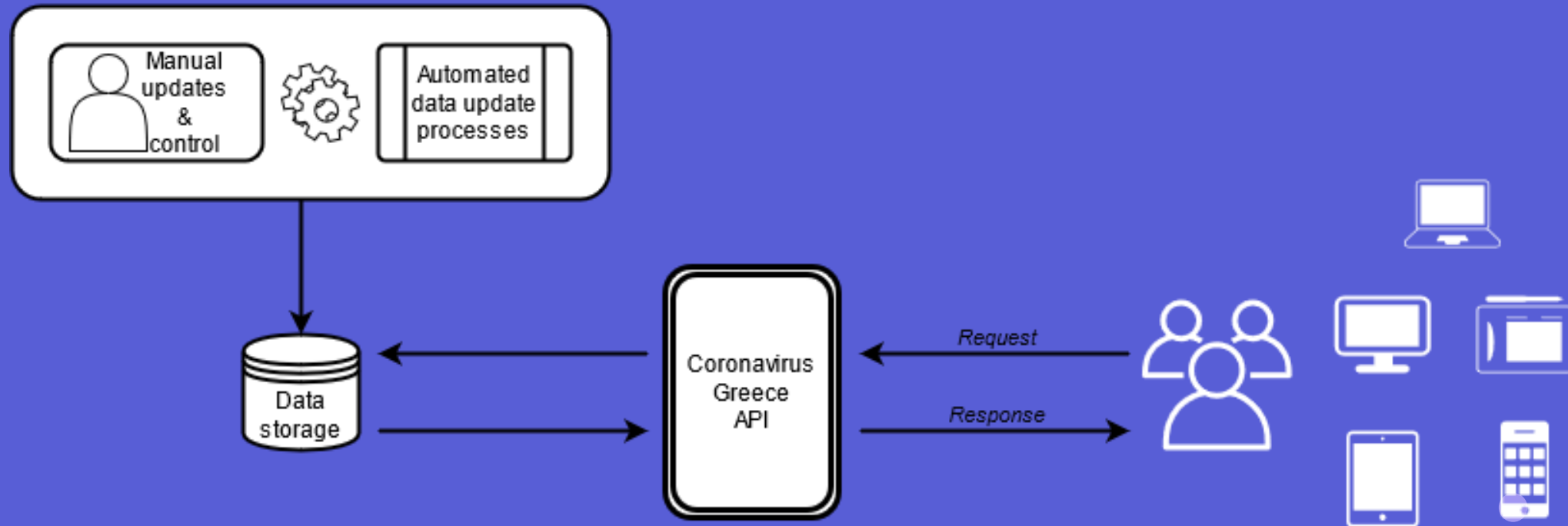
What is an API? - A familiar analogy



What is an API?



Coronavirus Greece API



Coronavirus Greece API

Python

```
import requests

url = "https://covid-19-greece.herokuapp.com/total-vaccinations-per-region"
response = requests.get(url)

print(response.json())
```

Javascript

```
let url = "https://covid-19-greece.herokuapp.com/total-vaccinations-per-region"
fetch(url)
  .then(response => response.json())
  .then(json => console.log(json))
```

Example: Getting vaccination data per Greek region

Sending a Request

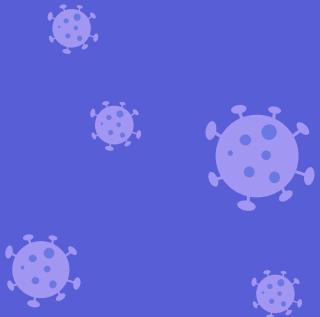


Coronavirus Greece API

JSON format

```
{
  "total-vaccinations": [
    {
      "area_en": "Aetolia-Acarmania",
      "area_gr": "ΑΙΤΩΛΟΑΚΑΡΝΑΝΙΑΣ",
      "referencedate": "2021-04-21",
      "totaldistinctpersons": 26528,
      "totaldose1": 26528,
      "totaldose2": 6940,
      "totalvaccinations": 33468
    },
    {
      "area_en": "East Attica",
      "area_gr": "ΑΝΑΤΟΛΙΚΗΣ ΑΤΤΙΚΗΣ",
      "referencedate": "2021-04-21",
      "totaldistinctpersons": 50818,
      "totaldose1": 50818,
      "totaldose2": 17424,
      "totalvaccinations": 68242
    },
    ...
  ]
}
```

Receiving a Response

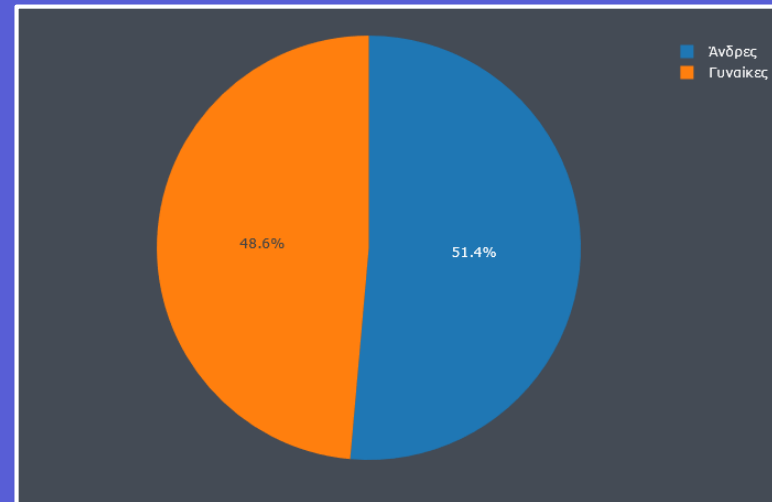
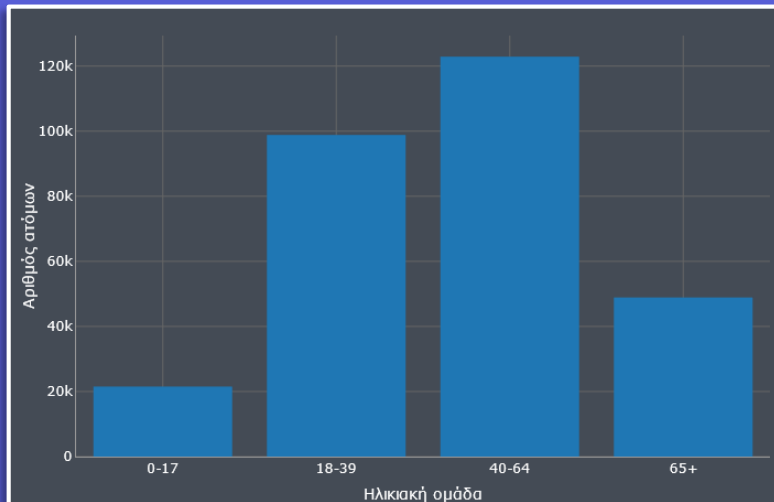
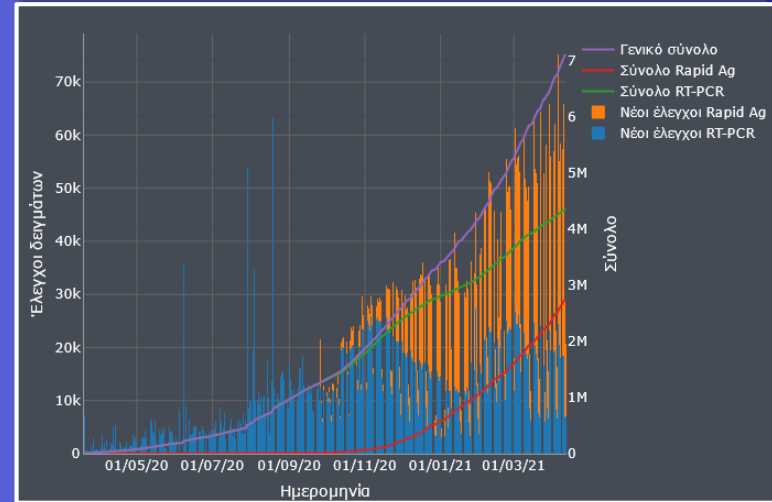
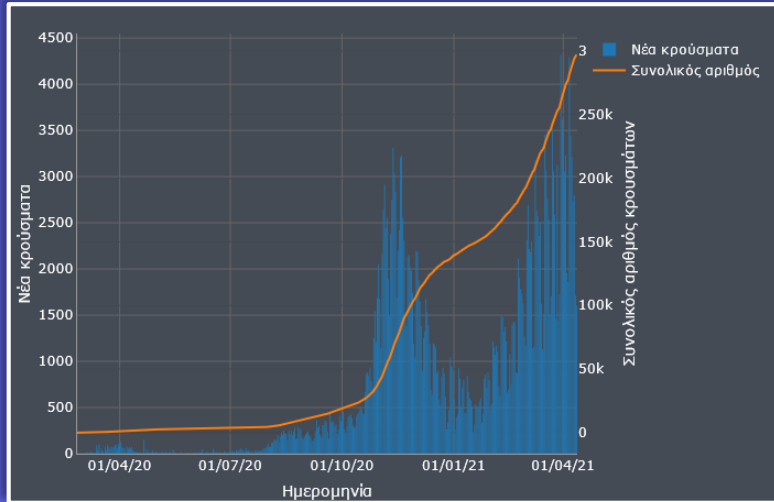


Covid Data Exploration (CovidDEXP)

- ✓ An exploratory **data analysis tool** with a **visually rich presentation** of the COVID-19 pandemic
- ✓ Processing of reliable real-time evolving data with qualitative data examined against a series of selected indicators to **monitor** and **detail** the virus outbreak

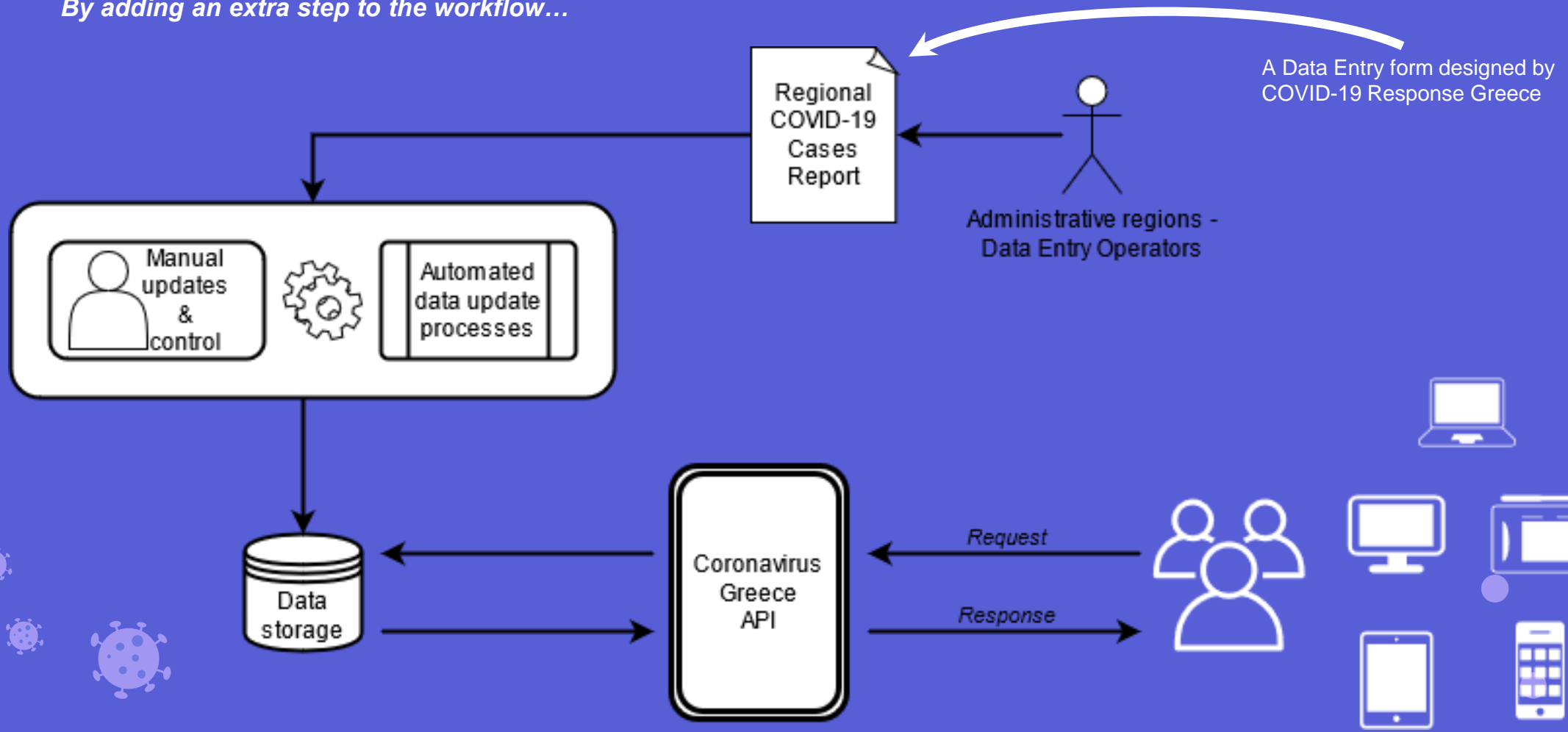


Covid Data Exploration (CovidDEXP)

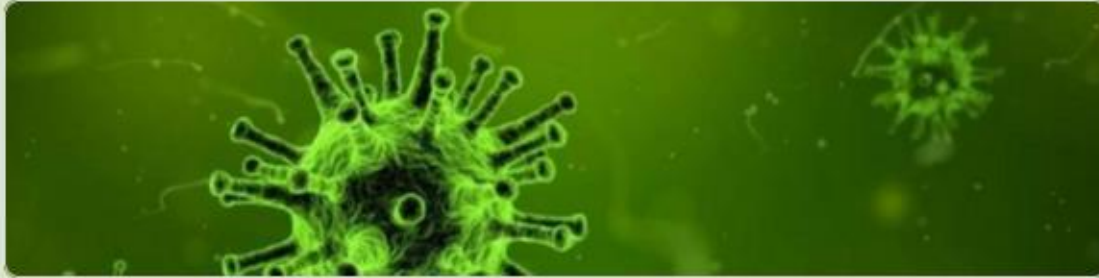


Enhancing the data resolution

By adding an extra step to the workflow...



Enhancing the data resolution



Περιφέρεια Δυτικής Μακεδονίας -
Κορωνοϊός

ΓΕΝΙΚΟ ΝΟΣΟΚΟΜΕΙΟ ΚΟΖΑΝΗΣ "ΜΑΜΑΤΣΕΙΟ"

Νέες Δειγματοληψίες

Your answer

Νοσηλευόμενοι (Τρέχων αριθμός)

Your answer

Νοσηλευόμενοι εκ των οποίων Θετικοί

Your answer

Νοσηλευόμενοι εκ των οποίων Αρνητικοί

Your answer

Νοσηλευόμενοι εν Αναμονή Αποτελεσμάτων

Your answer

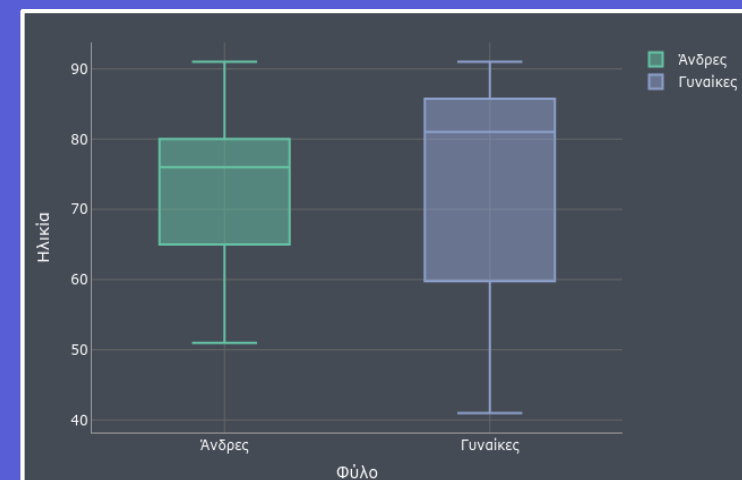
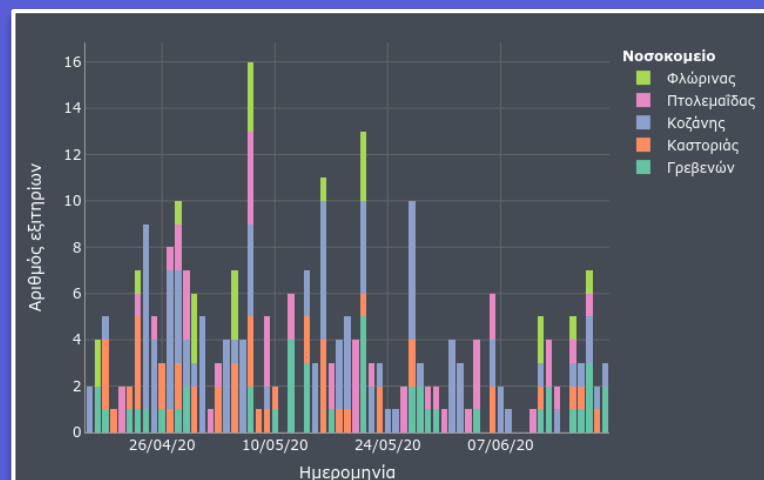
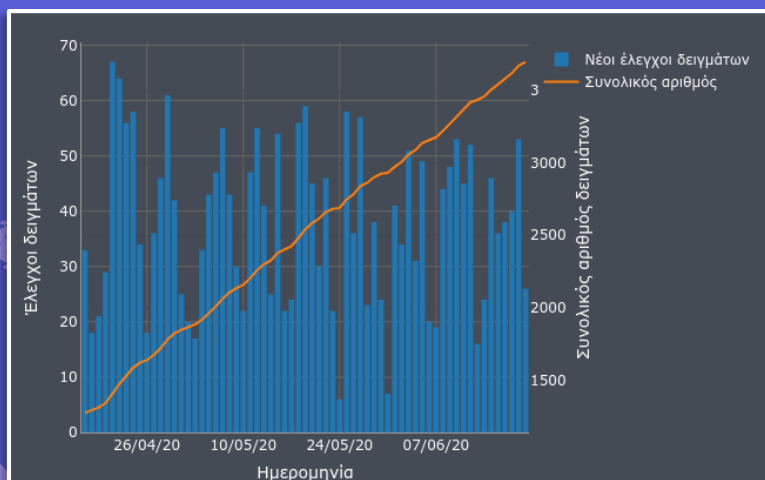
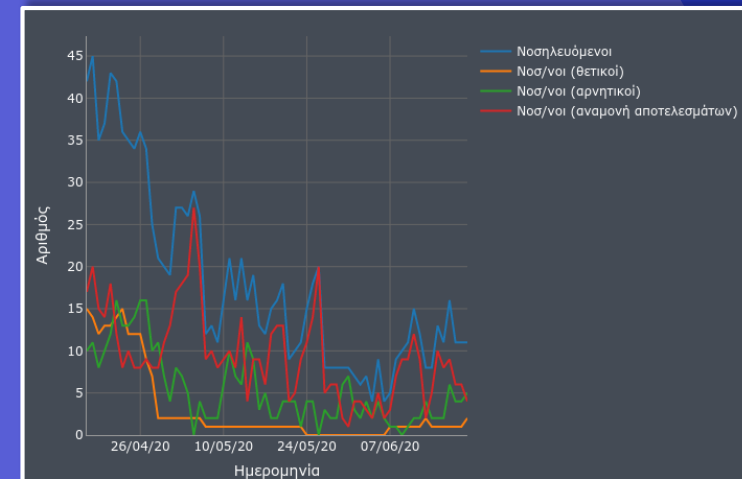
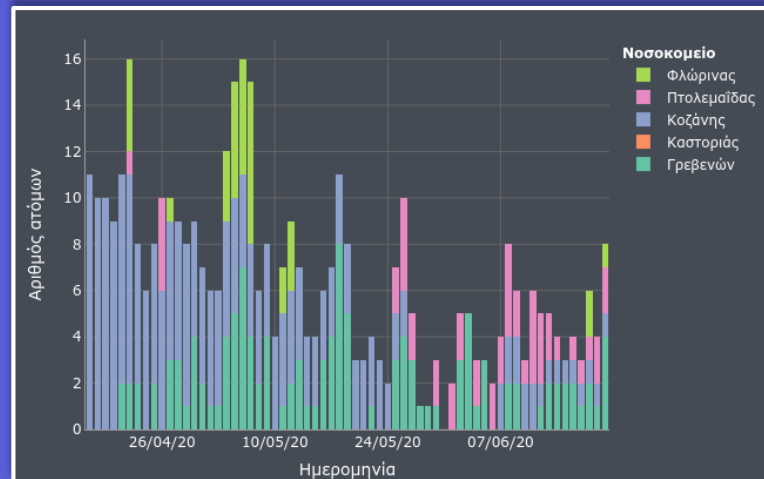
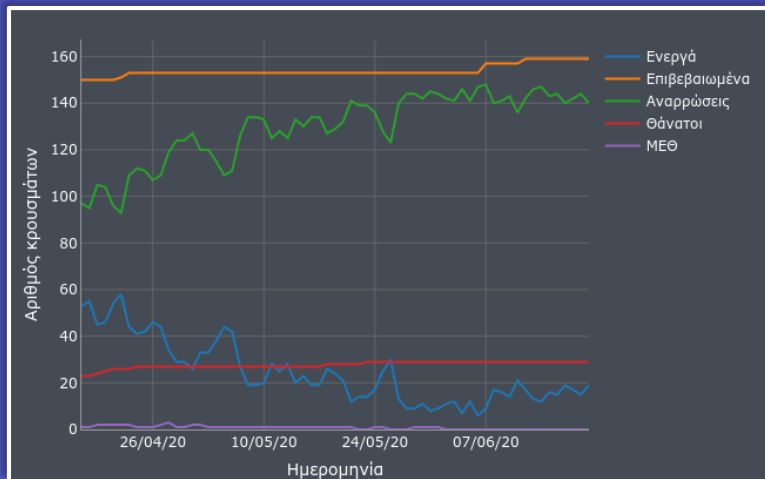
Νέα Εξιτήρια

Your answer

Σε κατ' οίκον περιορισμό (Τρέχων αριθμός)

Your answer

Enhancing the data resolution



OpenDataRef

- ✓ A **data visualization tool** concerning the spread of COVID-19 in the accommodation structures of refugees, immigrants and asylum applicants in Greece

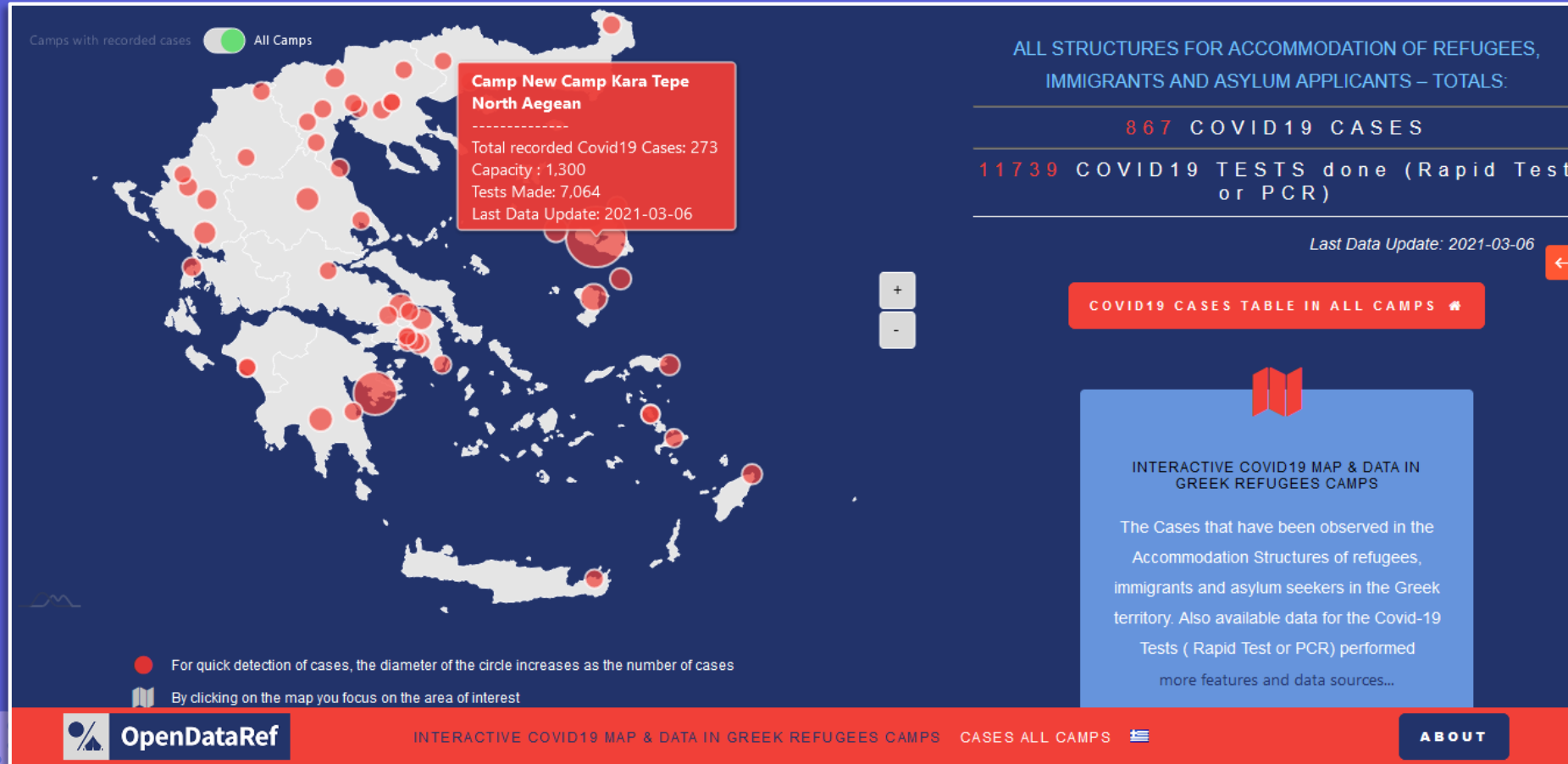


OpenDataRef



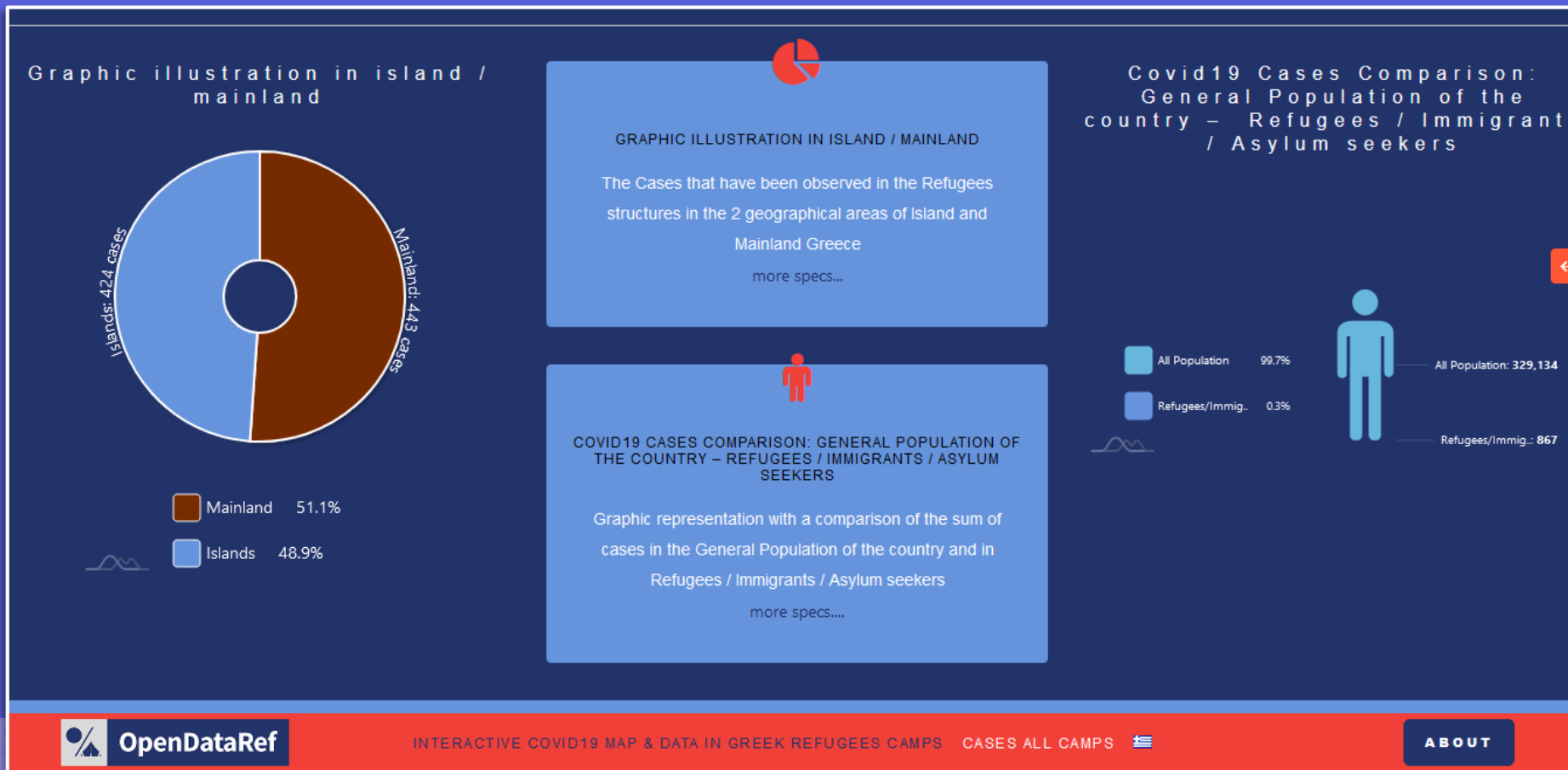
Beta Version

OpenDataRef



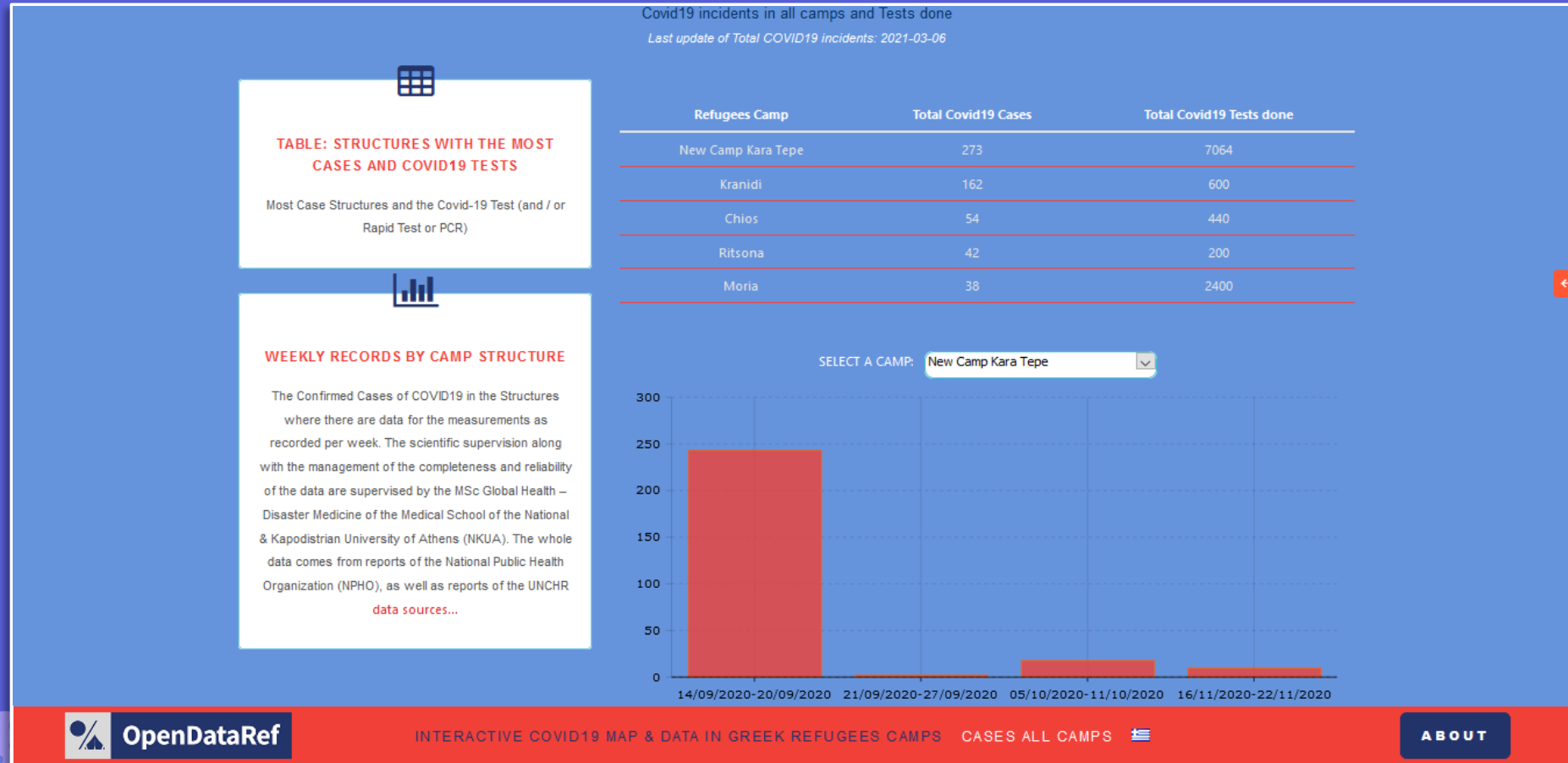
Beta Version

OpenDataRef



Beta Version

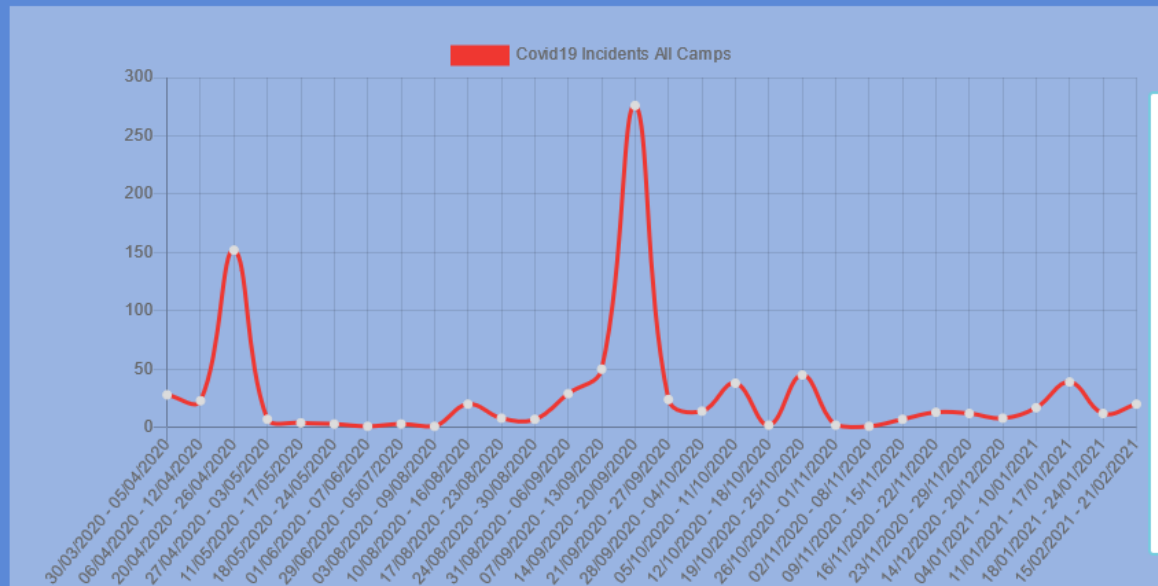
OpenDataRef



Beta Version

OpenDataRef

LINEAR CHARTER WITH THE TOTAL CASES OF COVID19 PER WEEK OF AVAILABLE MEASUREMENTS



TOTAL RECORDS OF COVID19 CASES PER WEEK OF AVAILABLE MEASUREMENTS

Bar chart with the total cases of COVID19 per week of available measurements in the structures of accommodation of refugees, immigrants and asylum seekers in the Greek territory. All the data comes from EODY reports, from published data of the UN High Commissioner for Refugees.

[data sources...](#)



X-COVID

| ***AI ASSISTANT***

An AI solution on detecting COVID-19 signs



The situation during the first wave of Covid-19



Coronavirus pandemic provoked a stress on the health care system



Massive demands for tests, diagnosis and treatment



Delaying decision-making for patients could be fatal

The situation during the first wave of Covid-19

Problem

Shortages and delays in PCR tests



A promising solution

Chest X-Rays: An alternative fast and affordable way for doctors to triage patients

Can AI shed light?



Health-care AI is already a booming area of research



Impressive results for analyzing medical images to identify diseases such as breast and lung cancer or glaucoma at least as accurately as human specialists

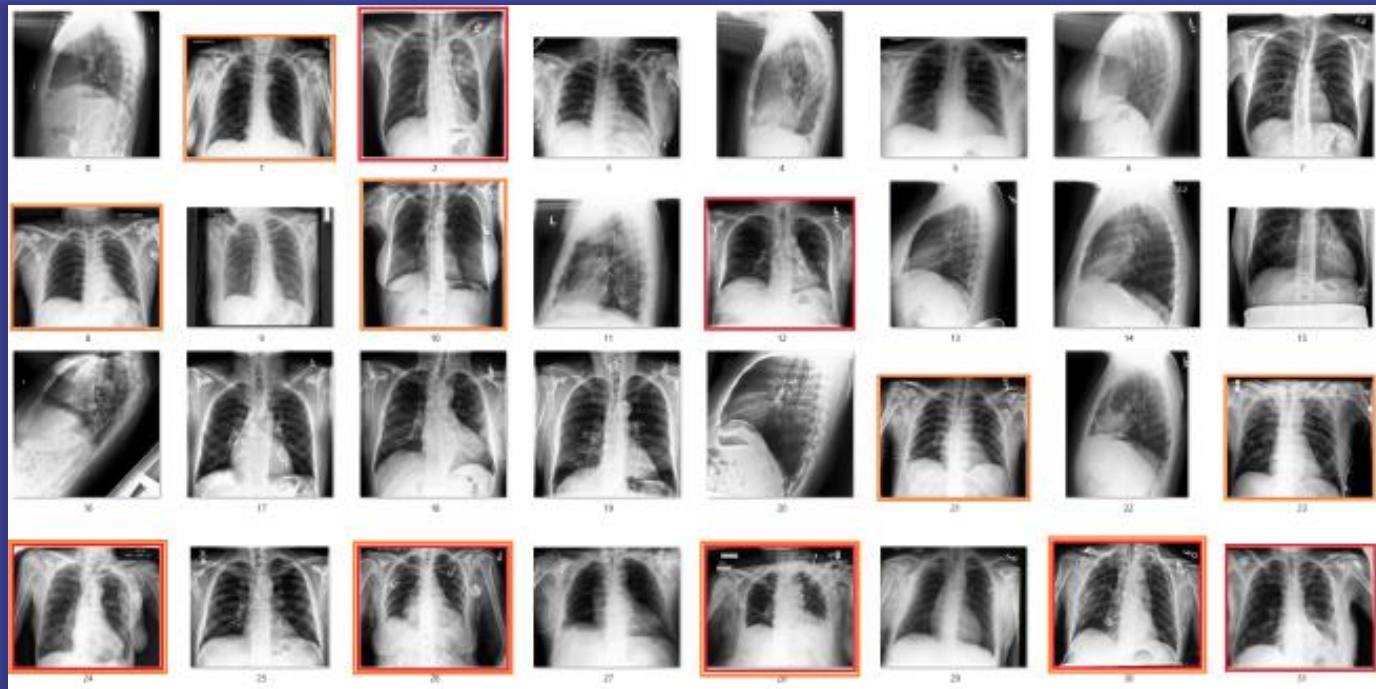


Is **Covid-19** the next candidate?

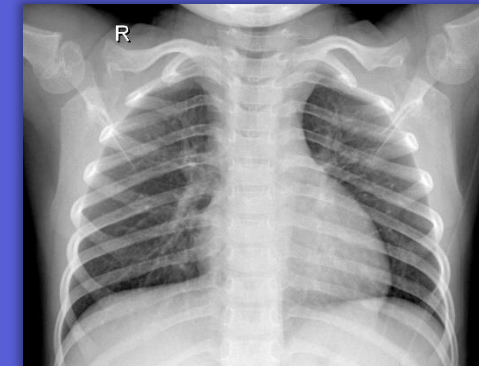
COVID-Net Open Source Initiative

Use of an open database with healthy and Covid-19 diagnosed Chest X-Rays, to train a model to discover potential Covid-19 signs

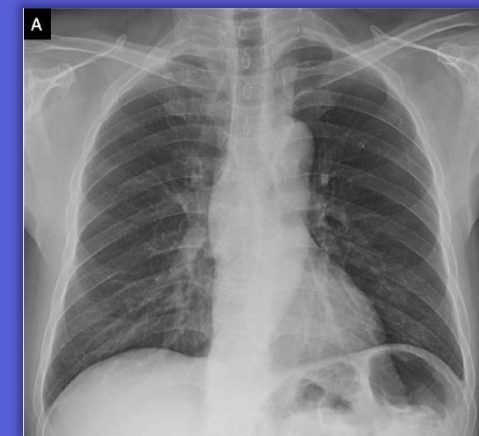
>90% Prediction Accuracy



Healthy Case



COVID-19 Case



X-COVID AI Assistant



MIT Technology review,
23 Apr 2020

"In many hospitals, patients often have to wait lots of hours for a specialist to conduct the diagnosis. If an emergency room doctor could get an initial reading from an AI-based tool, it could dramatically shrink that wait time"

- Covid-19 Detection as a Service -



Integration of the COVID-Net model into an **application** that could be used by doctors as a guide on the examination process and triage

X-COVID AI Assistant

A tool to detect signs of COVID-19 presence from Chest X-Rays using Deep Learning

Upload a Chest X-Ray

You can find example images to use [here](#).

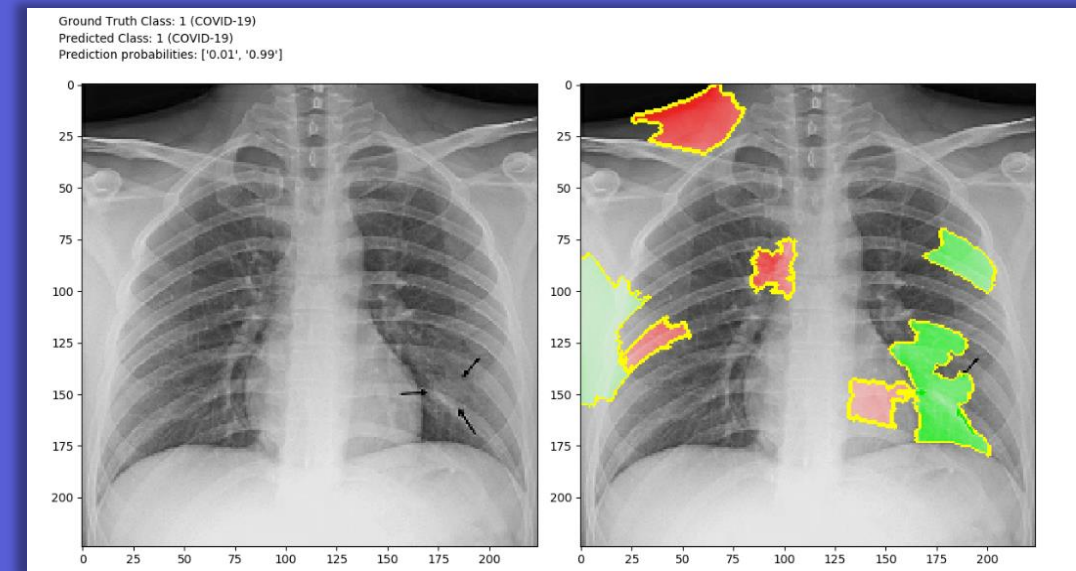
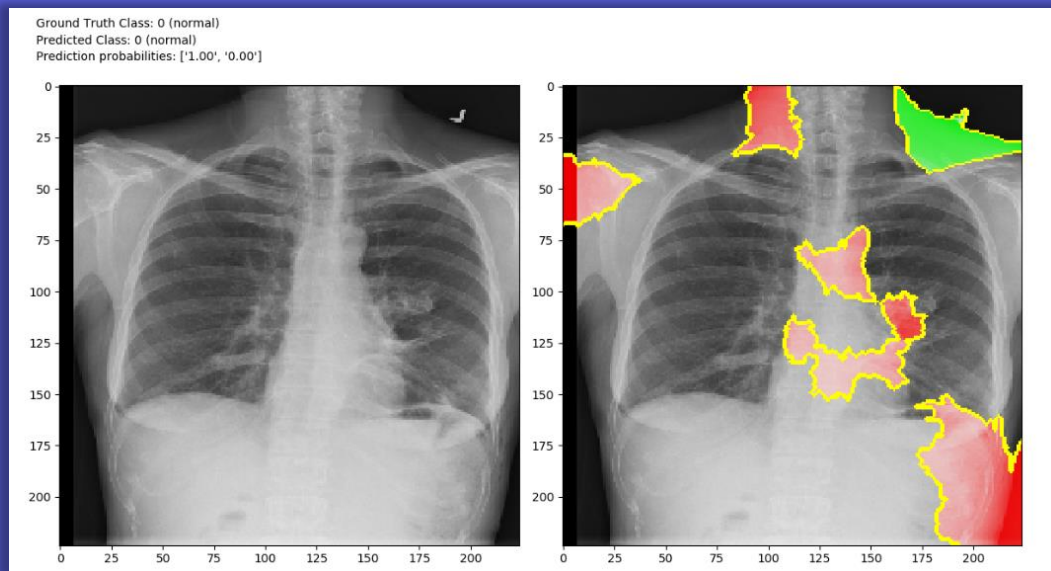


Max file size: 5mb, accepted: jpg/png

Choose images

Machine Learning on Chest X-Rays

Utilizing LIME algorithm to understand the models' predictions



The Day After Corona



Ready-to-use solutions for a future virus outbreak



Applications can be **adjusted** to solve relevant problems

Thank you 😊

#StaySafe

