

In December 2019, in Wuhan, Hubei Province, China the first case of COVID-19 was reported on a person suffering from severe flu-like illness. The pathogen behind the disease was identified in January 2020 as a novel coronavirus, subsequently named SARS-CoV-2 which stands for Severe Acute Respiratory Syndrome Coronavirus-2. Later, the term "COVID-19" where 'CO' stands for 'corona', 'VI' for 'virus', and 'D' for disease, and 19 represents the year of its occurrence, i.e., 2019 was coined by the World Health Organization (WHO) in February 2020. The COVID-19 pandemic has surfaced as a crucial threat to public health worldwide. It has had a drastic impact on the economic stability and social life of various countries across the globe and has also highlighted the functioning of their respective societies and gov-

# ECDC proposes five primary objectives when testing for COVID-19:

To control overall transmission of the disease.

Monitor transmission rates and severity of the disease.

Ease the impact of COVID-19 in hospitals and care homes.

Detect clusters or outbreaks of the disease in specific settings.

Prevent a recurrence of COVID-19 once it has been brought under control.

**#COVID19**





## BEST PRACTICES

STUDY DESIGN	INSTRUMENTS	INTERVIEWERS' TRAINING	DATA COLLECTION	DATA ANALYSES AND REPORTING	DATA DISSEMINATION AND USE
Include all types of residential arrangements, including households and residential care facilities.	Use standardized instruments that reflect comprehensive definitions and are devoid of stigmatizing terms.  Adapt all instruments and procedures.	Train interviewers on the biopsychosocial model of disability and on how to follow inclusive interviewing protocols.	Implement inclusive protocols.  Have mechanisms in place to check data quality and handle any unforeseen situation related to collecting data from and about persons with disabilities.	Follow the required steps to generate standard indicators on persons with disabilities.  Disaggregate results according to disability status.  Generate inclusive report materials.	Promote dissemination and discussion that involves persons with disabilities and civil society organizations as active stakeholders.

## ETHICS



**Weigh harms and benefits**



**Ensure privacy, confidentiality, consent and assent**



**Promote inclusive communication of findings**

## INCLUSIVE DATA CAN HELP ANSWER RELEVANT QUESTIONS



## Confirmed

(Confirmed cases only - not including deaths)

## Recovered

## Deaths

## Active

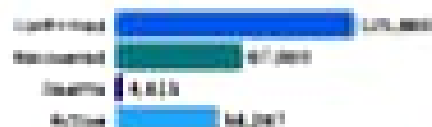
(Confirmed cases - recovered)

200,000

100,000

0

Total Cases: 2,027,000



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The diagram illustrates the transmission of COVID-19 through various settings. A central figure represents an individual, with arrows showing movement between different environments: Drive-Thru, Outpatient Appointment, Urgent Care for Shortages, Hospital Admission, Plasma Donation, and Lab. The diagram uses blue circles for 'Infected' and green circles for 'Susceptible' individuals, showing how the virus spreads through these interactions.

- 1) Insight into population and demographic subsets for an improved understanding of treatment patterns and accessibility
- 2) Longitudinal monitoring of pandemic response across different geographies to assess changes in practice patterns over time
- 3) Evaluation of diagnostic and serologic testing strategies to assess utilization patterns and performance across numerous health systems
- 4) Exposure of a critical absence of data flow of the type of diagnostic test administered (test results routinely appear in RWD; the actual test used often does not) (Figure 4)

- Appreciation for different capabilities of electronic health records (EHR) vs. claims as the dataset;
- Allowing heterogeneity in approaches for EHR vs. claims, but aspiring to align within the data source types;
- Balancing the need for alignment and model-building approaches driven by specific datasets;
- Rigor across Accelerators is greater than the need for expediency; a more prescriptive approach to study design and model selection is helpful.

```

graph LR
    A[Reconstruct] --> B[Generate plan]
    B --> C[Align on plan]
    C --> D[Loading]
    D --> E[Run Algo 1]
    E --> F[Evaluate Algo 1]
    F --> G[Run Algo 2]
    G --> H[Evaluate Algo 2]
    H --> I[Assign Algo 3]
    I --> J[Run Algo 3]
    J --> K[Evaluate Algo 3]
    K --> L[Generate map]
  
```

**Figure 4. Illustration of Data Movement (or Lack Thereof) for an Individual's Diagnostic Test Experience Over Time**

The diagram illustrates the parallel analysis process. It shows four data sources (Data Source #1 to #4) each being analyzed in parallel. The results of these individual analyses are then combined into a final 'Summary Analysis'.

**Citation:** Stewart M, Rodriguez-Watson C, Albayrak A, Asubonteng J, Belli A, Brown T, et al. (2021) COVID-19 Evidence Accelerator: A parallel analysis to describe the use of Hydroxychloroquine with or without Azithromycin among hospitalized COVID-19 patients. *PLoS ONE* 16(3): e0248128. <https://doi.org/10.1371/journal.pone.0248128>

1 2 3 4 5 6 7 8 9 10 11 12

Ans 1: Computing Results

1 2 3 4 5 6 7 8 9 10 11 12

Prerequisite Data Assessment Completed

**Figure 2. Therapeutics Research Questions of the Evidence Accelerator (Parallel Analysis Approach)**

- PCORnet
- Regenstrief/Lilly
- Sentinel (w/Data Partners)
- Synapse
- Target RWE(w/ Gilead)
- TriNetX
- Univ of California Health System
- Veterans Affairs
- Yale/Mayo

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

6 Finding Jim / Manuscript on Telling Characterization

9 Run Jim 2 Analysis

**Figure 3. Diagnostics Research Question of the Evidence Accelerator (Parallel Analysis Approach)**

Evidence Accelerators developed natural language processing script to extract information

- Hierarchical coding definition with lab as most specific, followed by COVID medication exposure, & presence of ICD10 code
- ICD10 codes now available and code list generated & sharable

Coding algorithms to identify medications of interest as part of combination or individual treatments have been developed and can be shared.

Real World Evidence (RWE) may help regulators and scientists augment information received in randomized clinical trials by shared insight, common research questions, innovative use of parallel analysis, rapid queries, and collaborative discussion. The Evidence Accelerator creates a strong foundation for rapid collection and rigorous analysis of RWD to answer urgent questions about COVID-19.





# Advanced **Data Visualization** Techniques, Tools and Solutions