



Track, analyse, simulate and predict infectious
disease outcomes globally in real-time

Advanced modelling to inform pro-active disease management

28 February 2023

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Forecast example: The tripledemic2023

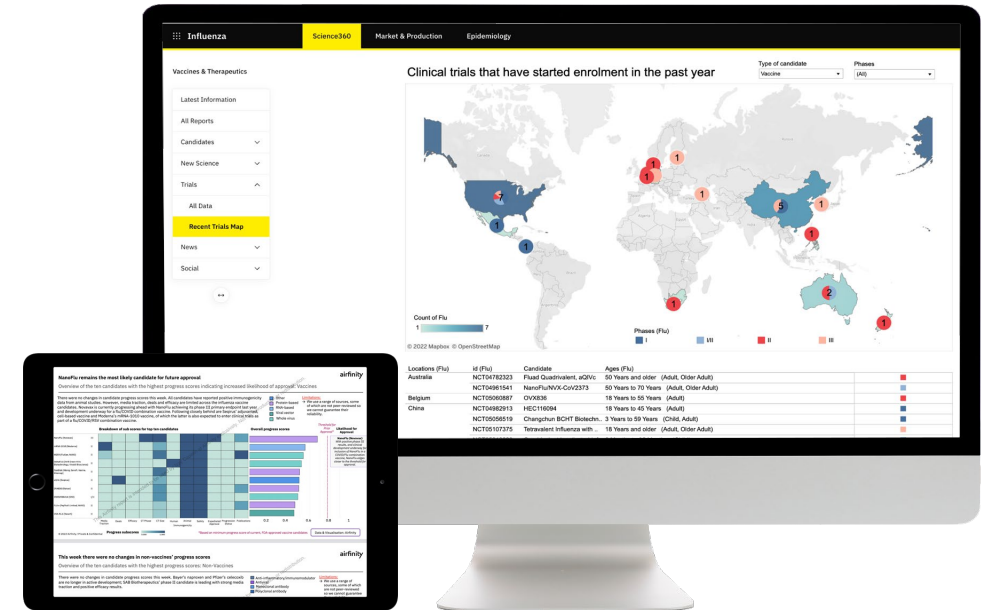
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Introduction to Airfinity

Introduction to Airfinity

Airfinity is a pioneer in predictive health analytics. Specialised in infectious diseases, we track, analyse, simulate and predict disease outcomes.

Headquartered in London, UK, our clients span all major continents.



We speak
20+
Languages

We monitor
180+
Countries

We track
160+
Diseases

Dynamic analytics and forecasting across the infectious disease landscape

Airfinity's proven Pandemic Preparedness Solution

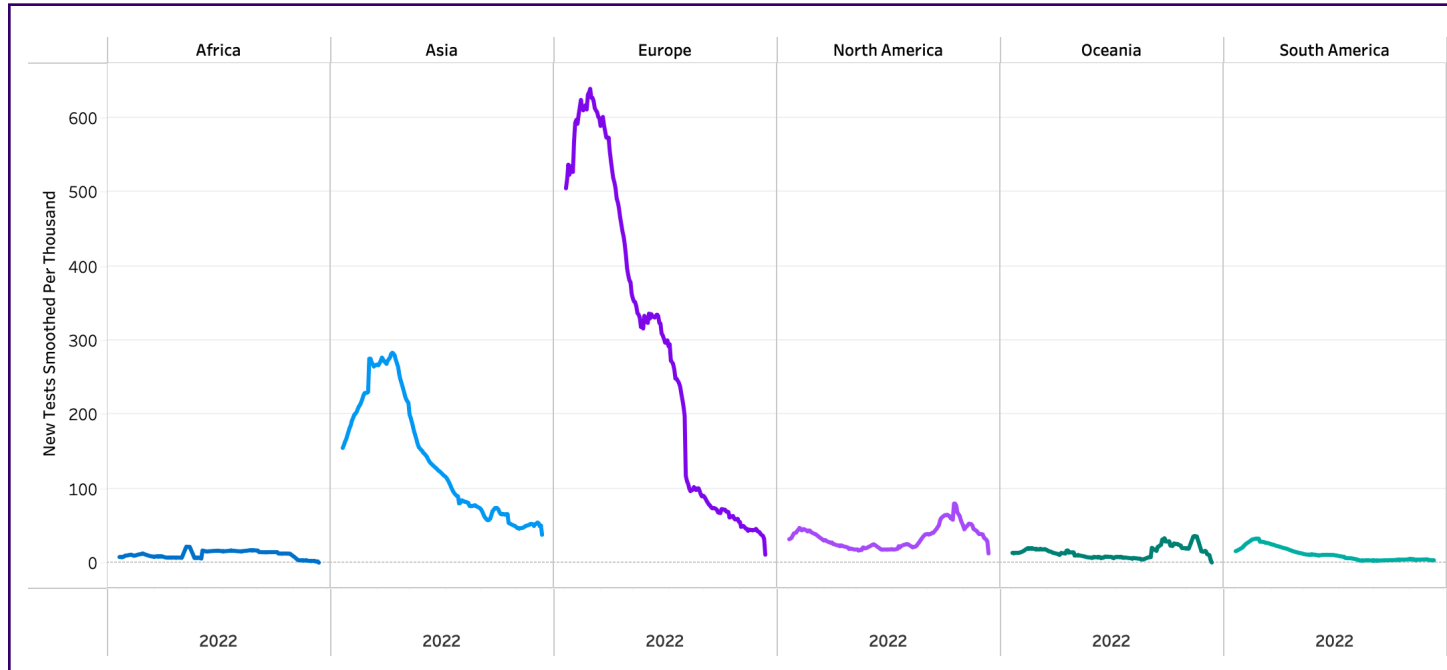
Airfinity offers the most comprehensive source of data across the infectious disease landscape globally to enable fast, effective decision-making and improve outbreak response through forecast modelling and analytics by subject matter experts.

Airfinity has worked with partners from governments, pharma, industry and non-profits to build its pandemic preparedness database to better predict the course of any outbreak.

Uniquely, the tracking of new and existing medical countermeasures to respond to outbreaks or invest in required innovative therapies forms part of that offering.

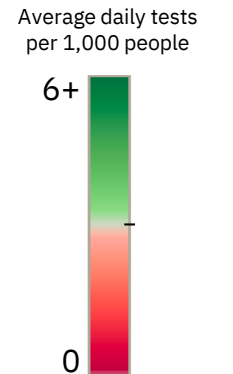
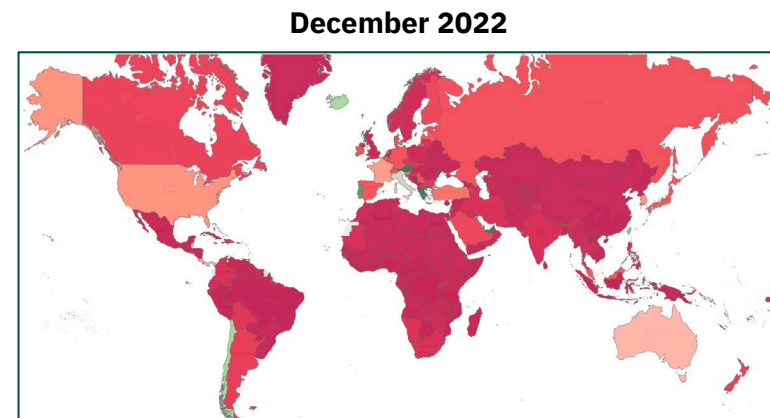
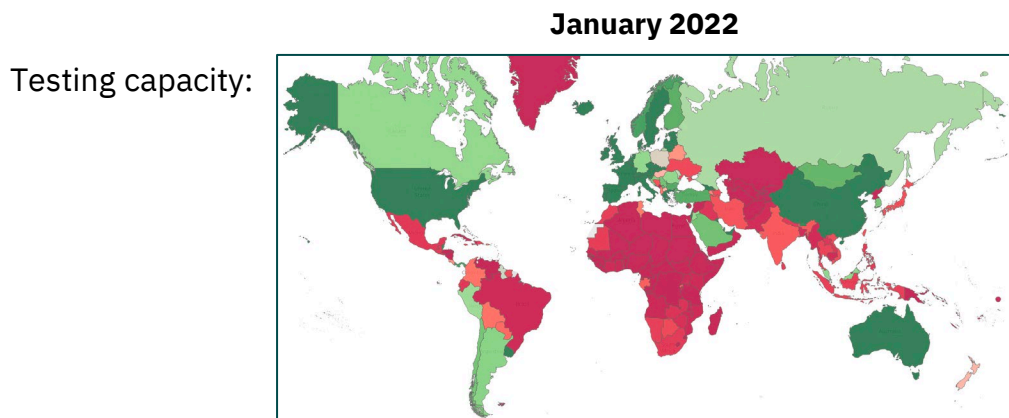
The world is once again flying blind

Global respiratory disease testing levels are below the threshold needed to determine outcomes



Global COVID-19 testing rates have reduced significantly throughout 2022, with almost every country reducing their national surveillance drastically.

Without adequate surveillance we are unable to accurately determine potential disease outcomes.



Airfinity offers an alternative, piecing together a picture of disease developments

Collecting, connecting, normalizing and analysing a wide range of data sources

01 **National surveillance departments**
e.g. UKHSA

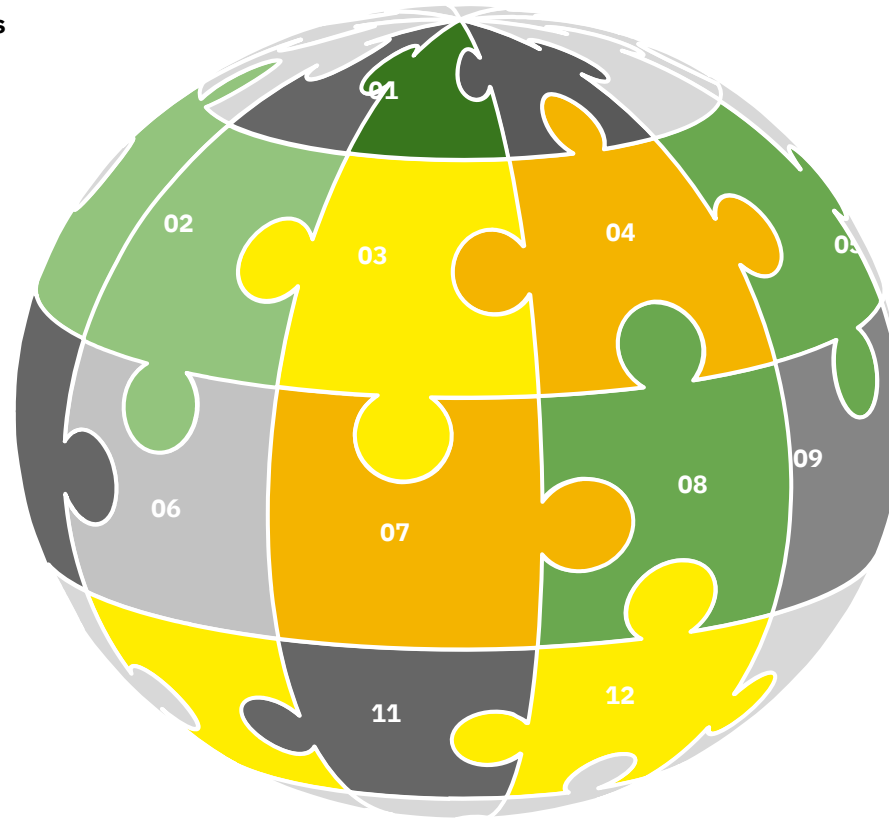
02 **A range of alternative signals**
Mobile device signals (e.g. temperature), social media

03 **Hospitals and mortality figures**
Mobile device signals (e.g. temperature), social media

04 **Vaccine and medicine sale**
Global vaccination levels and drug sales data

05 **Local Government Institutions**
Municipal and state level data

06 **Insurance Providers**
e.g. Health Insurance Providers, Corporates



Testing Providers/Labs 07
e.g. Illumina, Oxford Nanopore + range of smaller companies such as Biofire, Seegene

Wastewater Collection 08
e.g. CDC wastewater surveillance

Scientific Research Groups 09
e.g. funding bodies, multi centre initiatives

Testing Facilities 10
e.g. BioGroup, ACAS - workplace providers

Humanitarian/ Non-profit Networks 11
e.g. emerging infectious disease networks, Red Cross, UNICEF, Medicine San Frontieres

Zoonotic databases 12
e.g. OIE and individual testing labs globally

Supporting decisions to drive improved health and economic outcomes globally

“Airfinity has been instrumental in our country’s COVID response.”

Head of Government Vaccine Task Force

“You are helping us make better decisions”

European Commercial Lead, Bayer

“Airfinity has been critical in furnishing us and the rest of the world with COVID-19 numbers.”

Data Journalist, The Economist

“Vaccine production data from Airfinity has been spot on and its forecasts have been extremely correct.

Director General, IFPMA

“Airfinity is a true partner in pushing the absolutely critical work GeoVax does to advance vaccines into the clinical space. Their team provides exceptional collaboration and intelligent data analytics that support our organization in business and scientific decision making in a challenging, rapidly evolving emerging disease field.”

Project Director, GeoVax

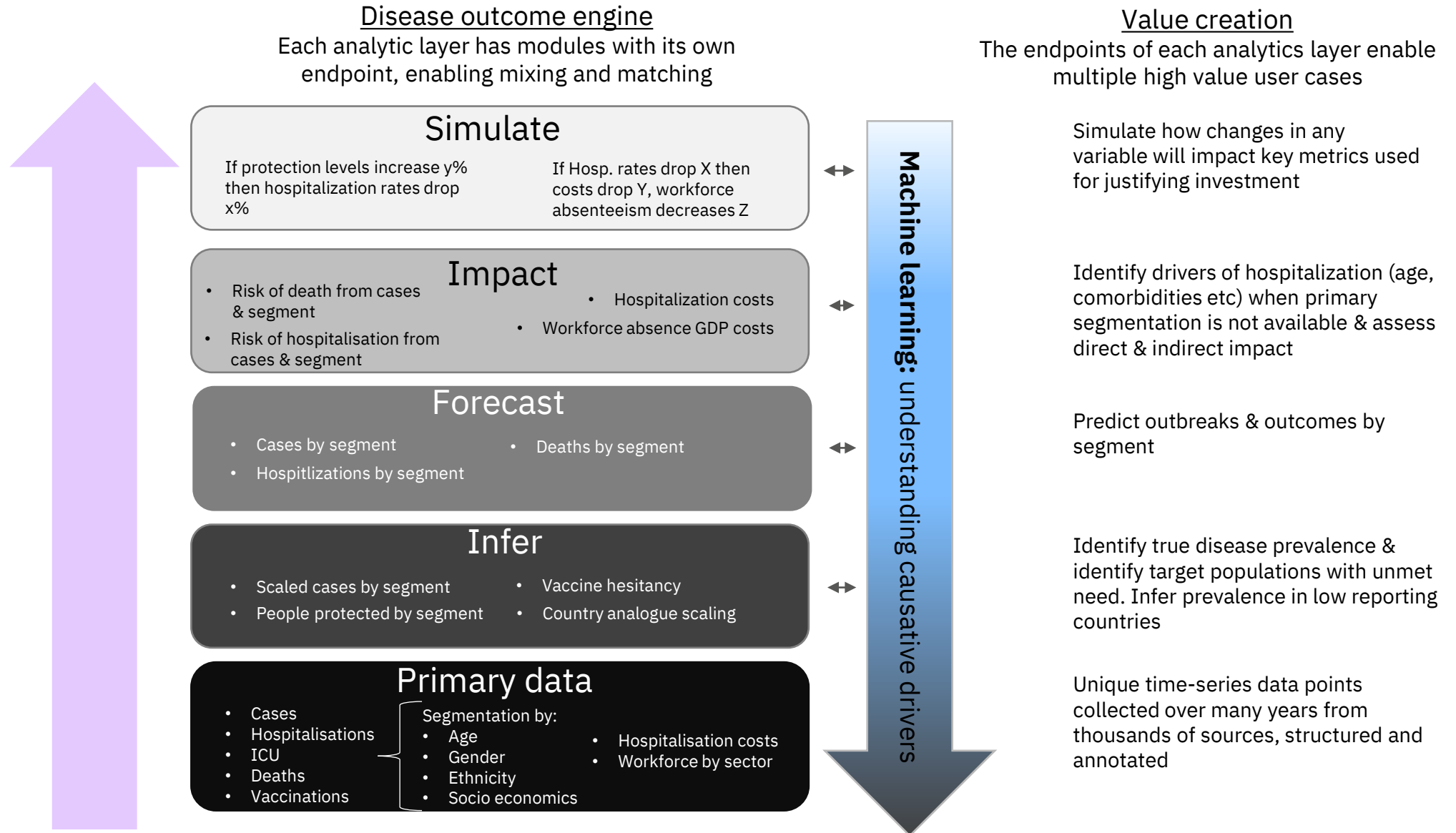


...and many more partners trust Airfinity.

Solutions

*Integrated analytics with access to
our expert team and 24 hour turn
around*

Bottom up data analytics approach to estimate and simulate disease outcomes in real time



The data & technology behind the disease engine

Providing the modelling capabilities, supplemented by data research, annotation & analysts

Data acquisition & annotation

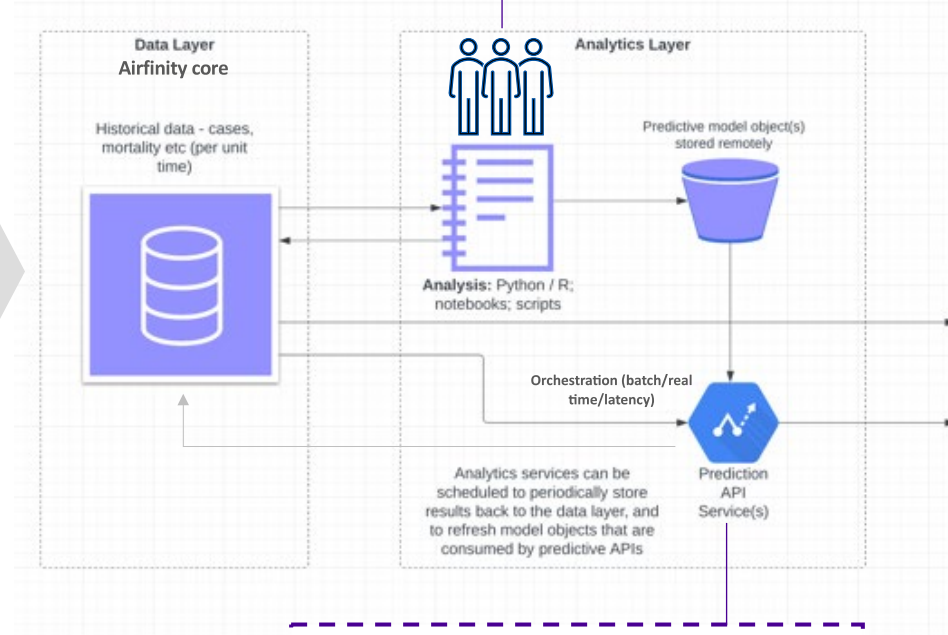
Disease burden/epidemiological	UK	US	France	Italy	Germany	Canada	Japan	China
Cases, hosp. deaths (N)								Color-coded bar
Modelled: Cases, hosp. deaths (forecast) (N)								Color-coded bar
People protected (N)								
Modelled: People protected (forecast) (N)								
Variant prevalence (N)								
Modelled: Variant prevalence (forecast) (N)								
Modelled: Estimated excess deaths per million (N)								
Diagnostic capacity								
Total tests per 1000 (N)								
Testing rate per capita (N)								
Sanitary measures per million (N)								
Airbnb population (average data from Propaq 2)								
Total airbnb population								
Total % population								
% population 65+								
VaTs not not capacity (N)								
VaTs reduced overview								
VaTs reduced programme								
VaTs immunisation/covid guidelines								
VaTs reduced rate and capacity (N)								
Modelled: VaTs hospitalizations averted analysis (N)								
Population/health economics measures								
Health care spend % GDP								
GDP Expenditure								
Health1000								
Country1000								
Revenue1000								
Number of institution care settings (during home etc)								
Number of institution facilities								

First party data
Lab networks, health systems, M&A

Dedicated data team for sourcing and curating data globally

Analytic builds & Model deployments

Team of PhD-level analysts (SMEs), analyzing and modelling the data



API deployment for real-time data access, rapid insights and scenario planning

Analysis & product delivery

Airfinity Biorisk
The world's most comprehensive biorisk surveillance solution, providing real-time alerts and analysis on emerging outbreaks and infectious diseases.

Real-time surveillance of 160+ diseases
The COVID-19 pandemic serves as a permanent reminder of the need for real-time infectious disease intelligence to better understand the current and future risk of different populations.

Daily Risk Alerts
A daily email alert with real-time risk assessment of outbreaks worldwide, including any new changes in cases or any new variants identified.

24/7 Platform Access
Get access to a 24x7 Global Outbreaks Tracker, as well as real-time epidemiological analysis and monitoring (including COVID-19 and Monkeypox), all with extensive filtering options and downloadable data.

Weekly Intelligence Reports
Airfinity Biorisk comes with two in-depth weekly intelligence reports to give decision makers a clear overview of current and upcoming threats.

Apps
Your plan has access to 19 apps.

- Disease COVID-19**: A complete 360 view on the progression of the COVID-19 pandemic, the political responses, and the landscape of vaccines and therapeutics.
- Disease Influenza**: A complete 360 view on seasonal Influenza and the latest science, competitive insights, and market analysis for relevant vaccines and therapeutics.
- Disease RSV**: A complete 360 view on seasonal RSV and the latest science, competitive insights, and market analysis for relevant vaccines and therapeutics.
- Disease Biorisk**: Monitor pathogenic threats with real-time epidemiology tracking, analysis, and more.
- Custom COVID-19 Epid**: COVID-19 epidemiology data split by demographics as well as variants prevalence data.
- Disease Oncology**: A complete 360 view on drugs in clinical development for a range of cancer types.

A disease centric “app” structure - a single source of truth in one place



Time series data on science, epid and market provides more accurate bottom up forecast and holistic risks than any other provider

airfinity
Biorisk Daily Briefing

14 November 2022

Summary

Ebola continues to spread across Uganda despite countermeasures, while the mild autumn weather in Sweden has prolonged the tick-borne encephalitis season. Mexico has reported an additional monkeypox-related death. COVID-19 cases and deaths are still increasing in Asia and cases are now up in Australia, with deaths expected to follow this increase soon.

Recent Outbreaks

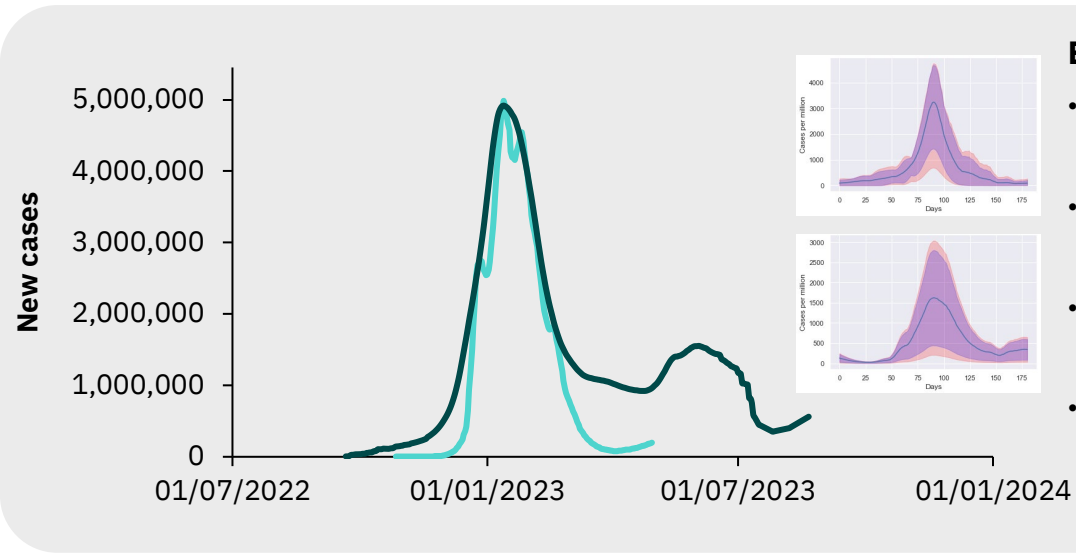
Multichannel data delivery, including “push” products, to reflect how decision makers consume information

How we support our clients

We have been the go-to source for analytics and insights throughout the pandemic

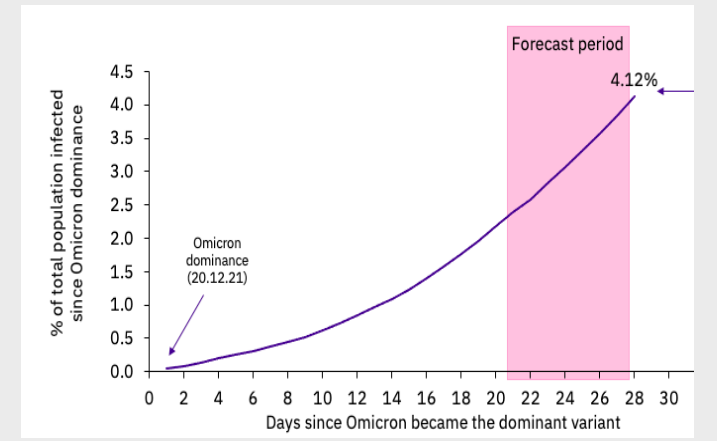
We have provided support throughout the pandemic covering the full landscape

COVID-19 analysis throughout the pandemic



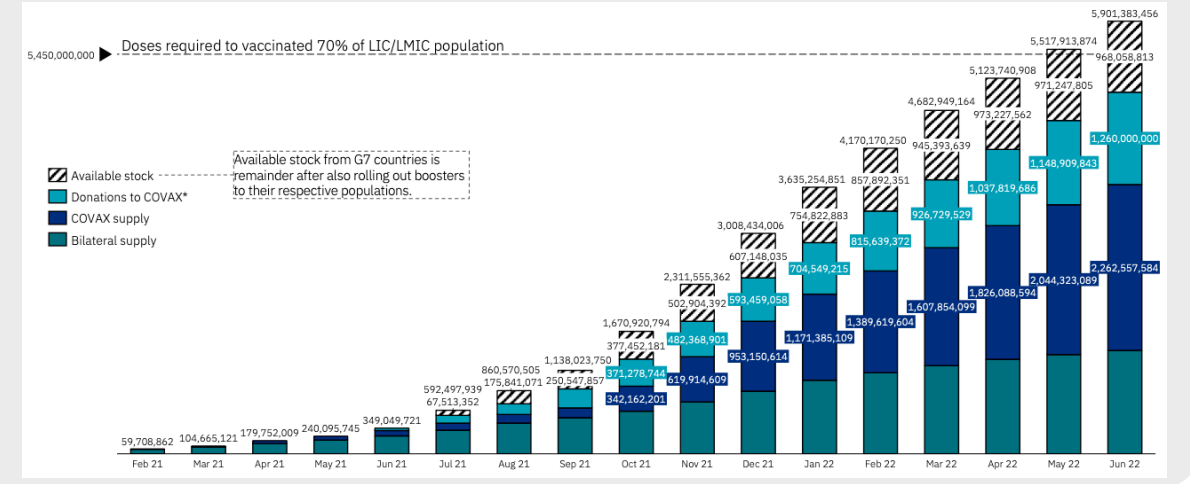
Epidemiology/disease burden

- Forecasted outcomes and spread of Omicron variant
- Estimated true disease burden in China and forecasted cases
- Predicted countries with high likelihood of harbouring new VoCs
- Predicted when waves would peak in each country and when new waves would begin



Vaccine and treatment availability and effectiveness

- Forecasted vaccine production scale up globally
- Forecasted deliveries of vaccines and vaccination rates, accurately predicting which countries would reach highest coverage first
- Forecasted vaccine donations, remaining stock and expired/wasted doses
- Modelled vaccine rollout capacity in LMICs & LICs for improved donation strategies
- Meta analyses of all available data to understand which Vx & Tx are best against different variants and waning immunity profiles



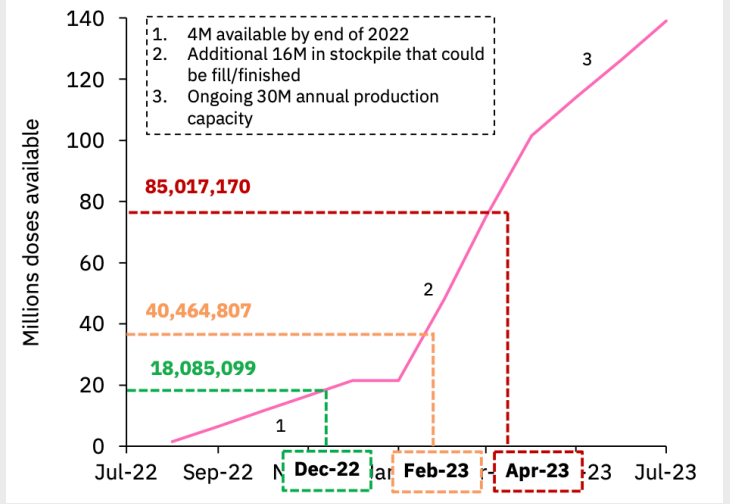
We track and deliver near real-time analysis on global infectious disease threats

Global disease coverage

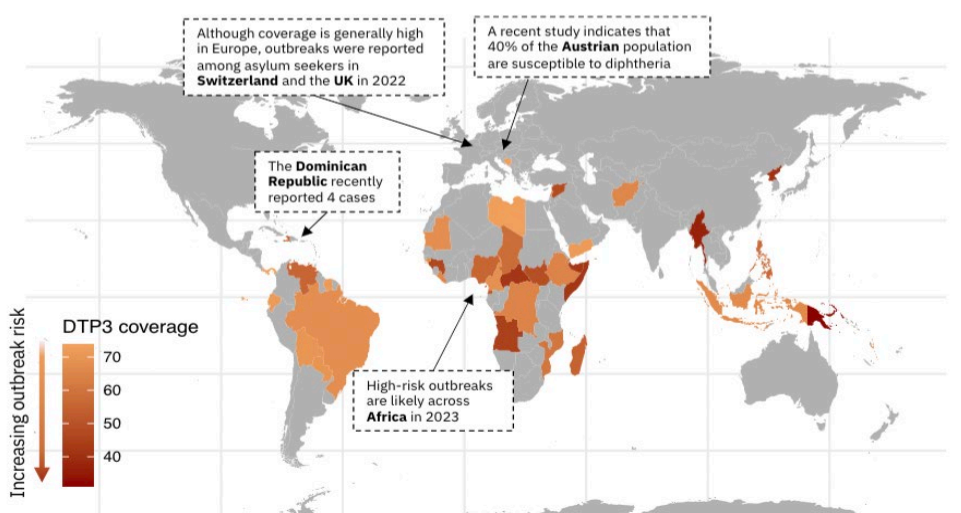
Rapid Mpox intelligence

- Following the announcement of mpox (previously monkeypox) being a global disease threat within a few days we produced a comprehensive report including:
- Vaccine & treatment availability & production capacity, supply contracts, pipeline overview, epidemiology data, and forecasted demand scenarios
- Modelled the impact of vaccinations on transmission and forecasted cases
- Supply and demand analysis: Forecasted vaccine demand scenarios and supply availability over time based on production capacity

MPX vaccine dose availability assuming **single fractional dosing strategy** and annual manufacturing capacity of 30 million doses*



Several African, Asian, and South American countries are at risk of diphtheria outbreaks
Map showing countries with DTP3* uptake below 75%



Global disease threats and outbreaks tracking

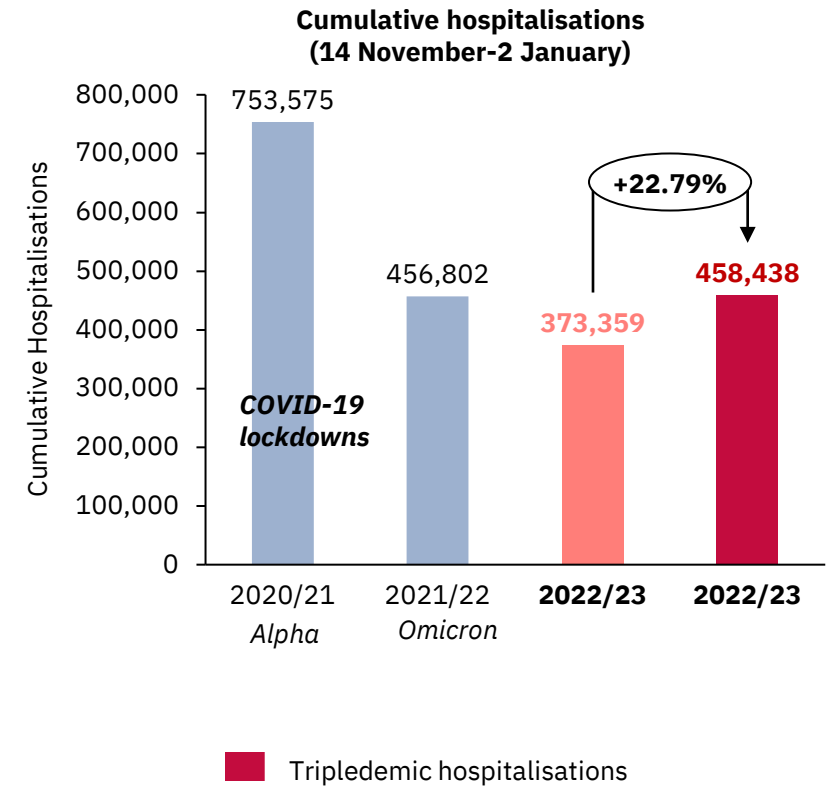
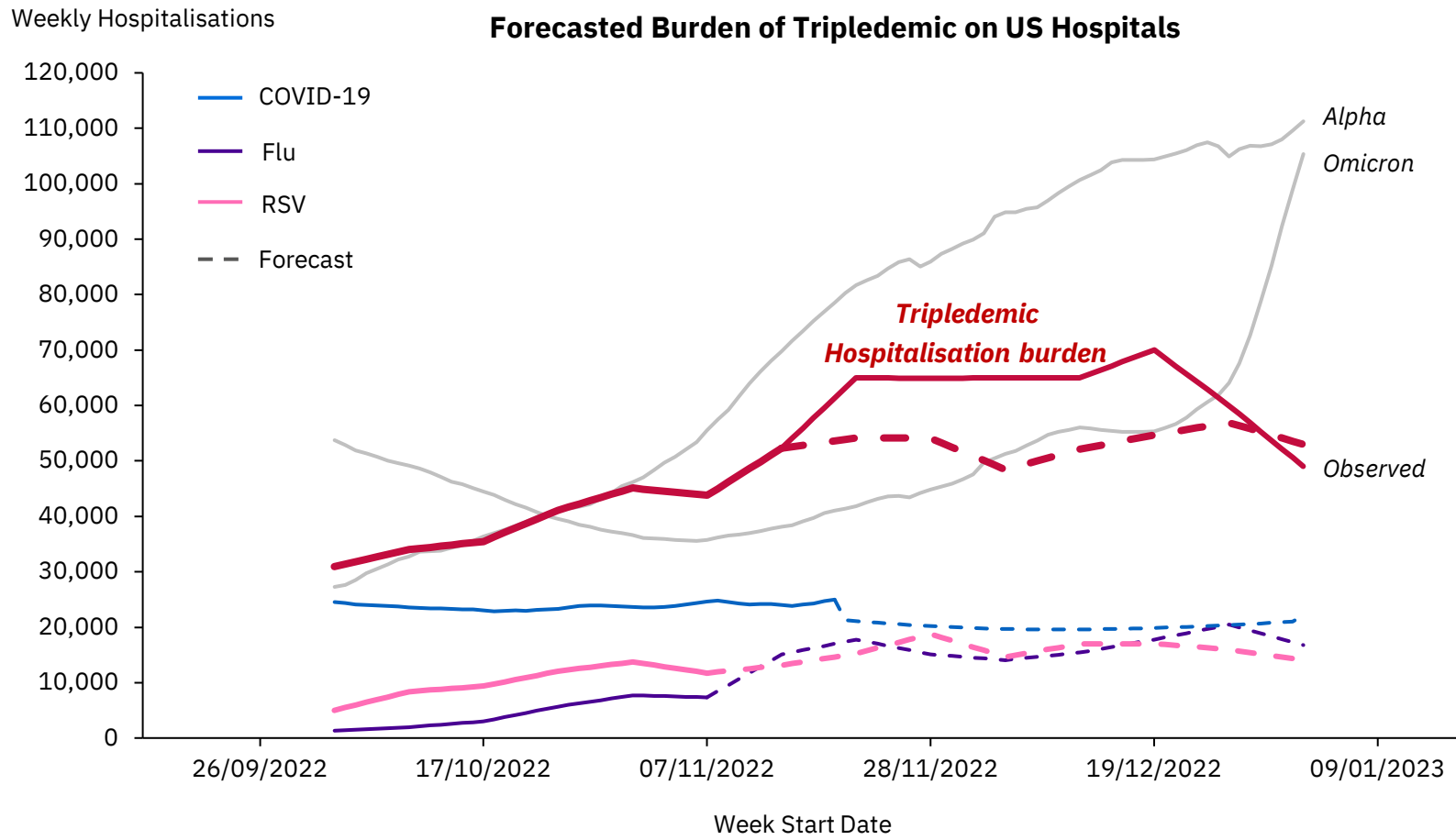
- We track all infectious diseases globally and have used that to predict and monitor outbreaks
- Outbreaks are risk assessed based on multiple metrics, including the respective country's capacity to manage disease spread
- Predicted dengue outbreaks due to changing climate
- Anticipating future outbreaks based on multiple indicators, such as zoonotic diseases and vaccine coverage

Our approach

The tripledemic in focus

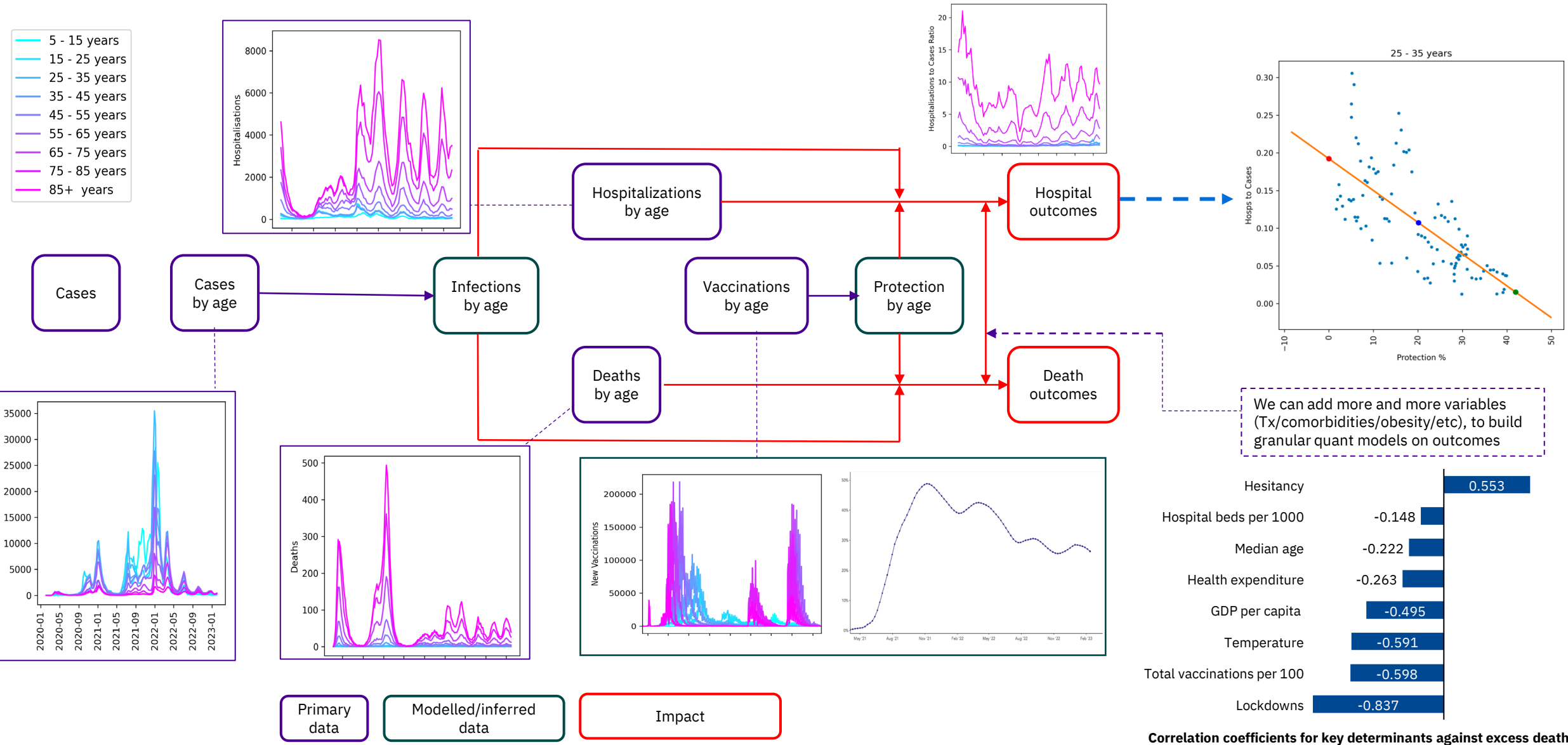
Tripledemic could cause >370,000 hospitalisations in US from now until end of year with peak of 57,000 a week

Based on projections of hospitalisations caused by COVID-19, influenza and RSV in the US



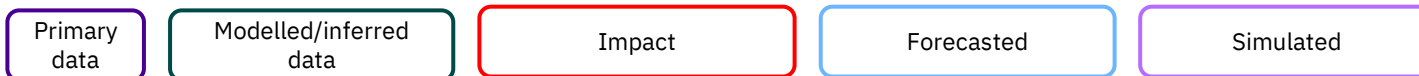
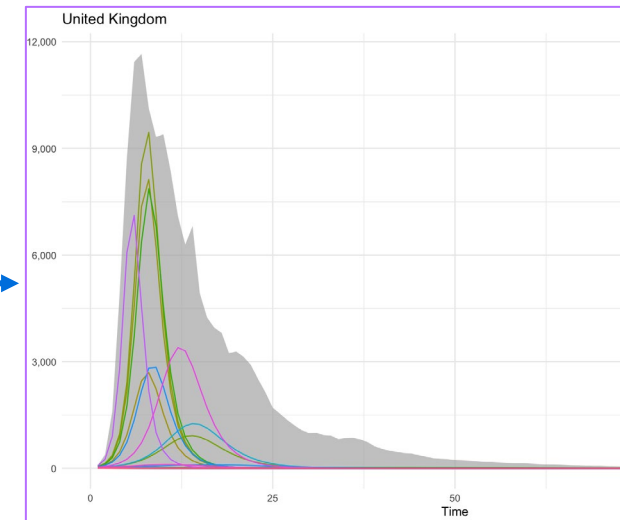
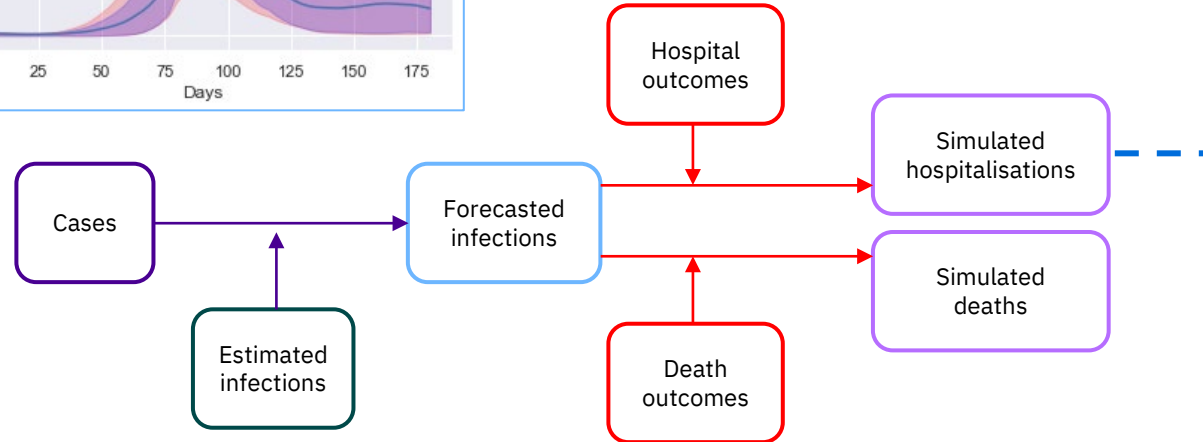
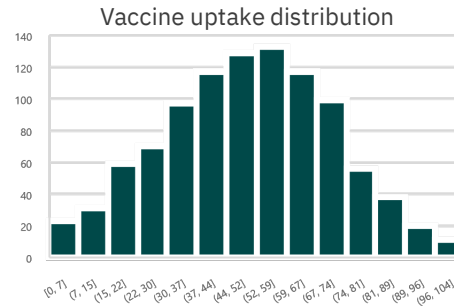
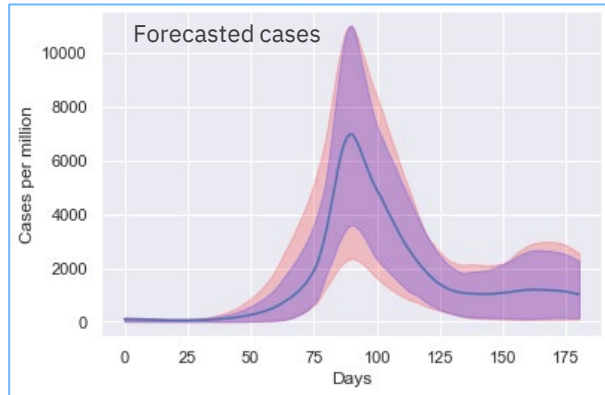
Disease outcomes are determined using multiple data points and models

Machine learning approach to understanding disease outcomes



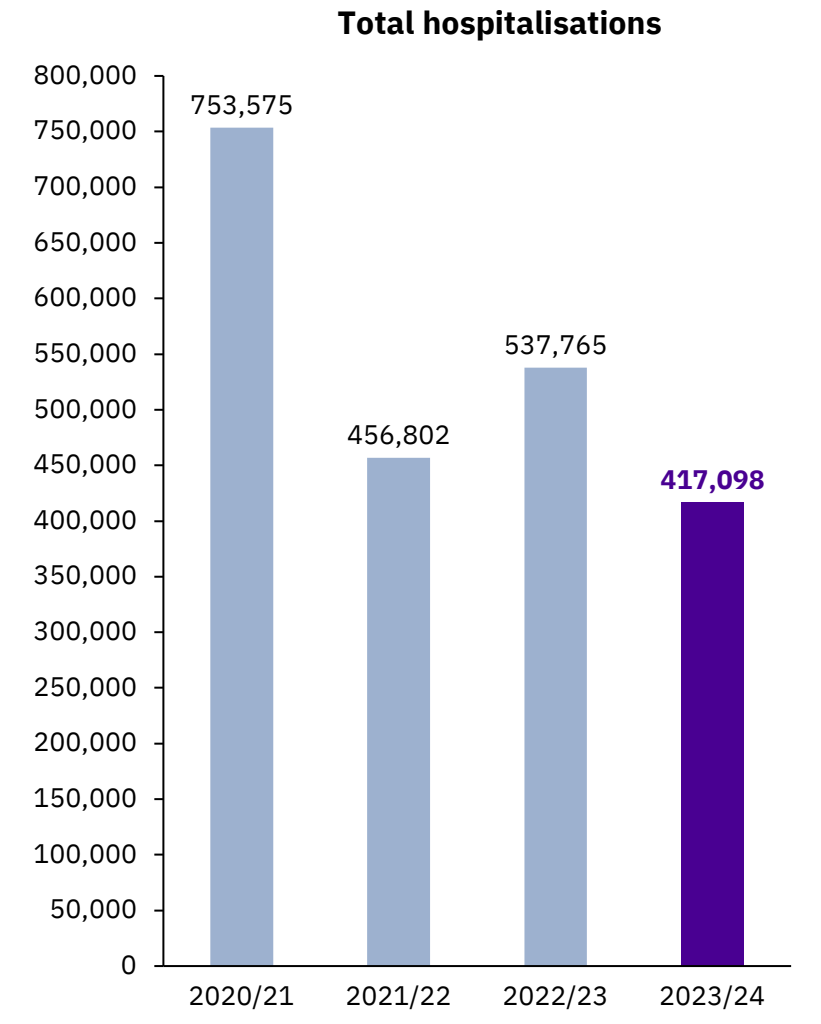
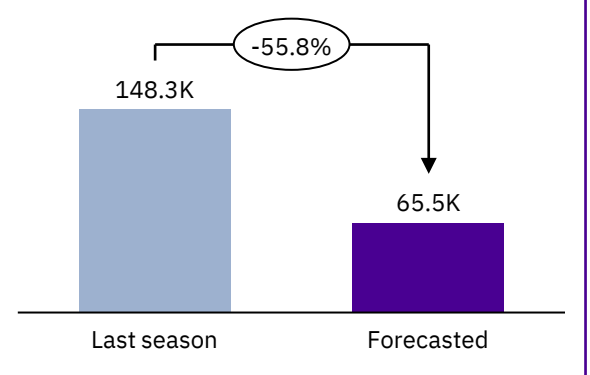
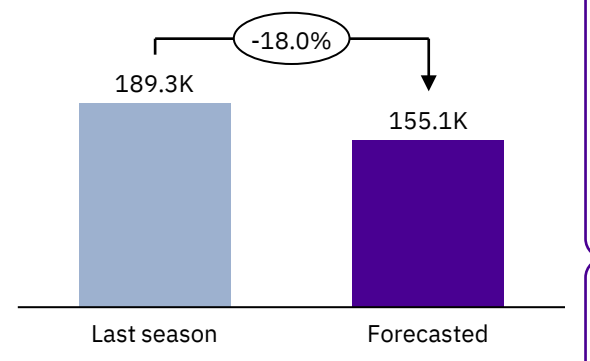
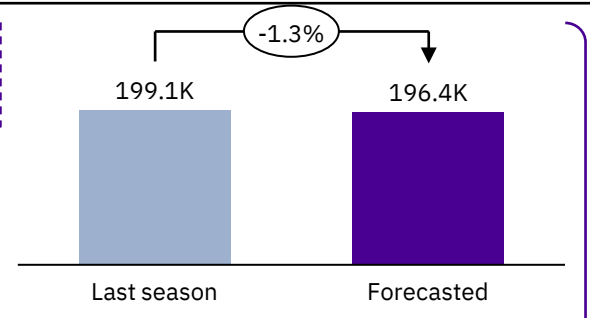
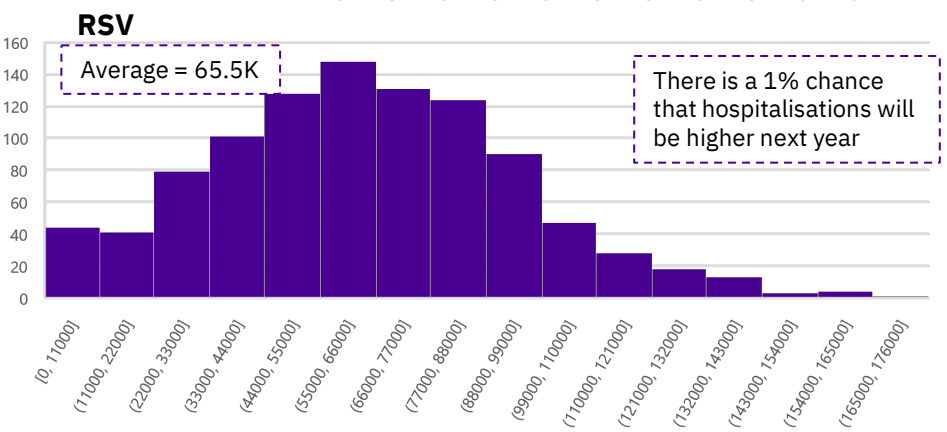
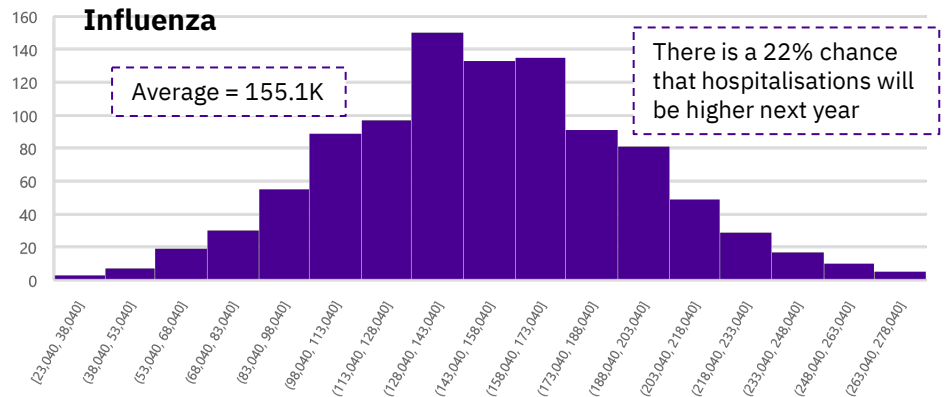
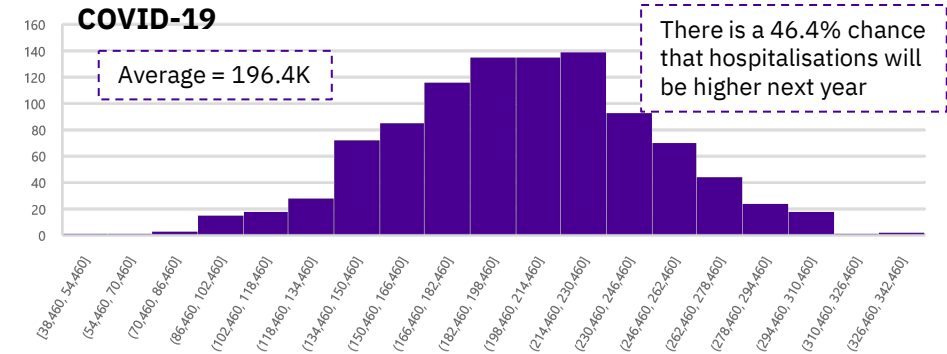
Forecasts are simulated using input distributions

Simulating future outcomes



Simulated outputs show current most-likely scenario and can assess the risk probability of future events occurring

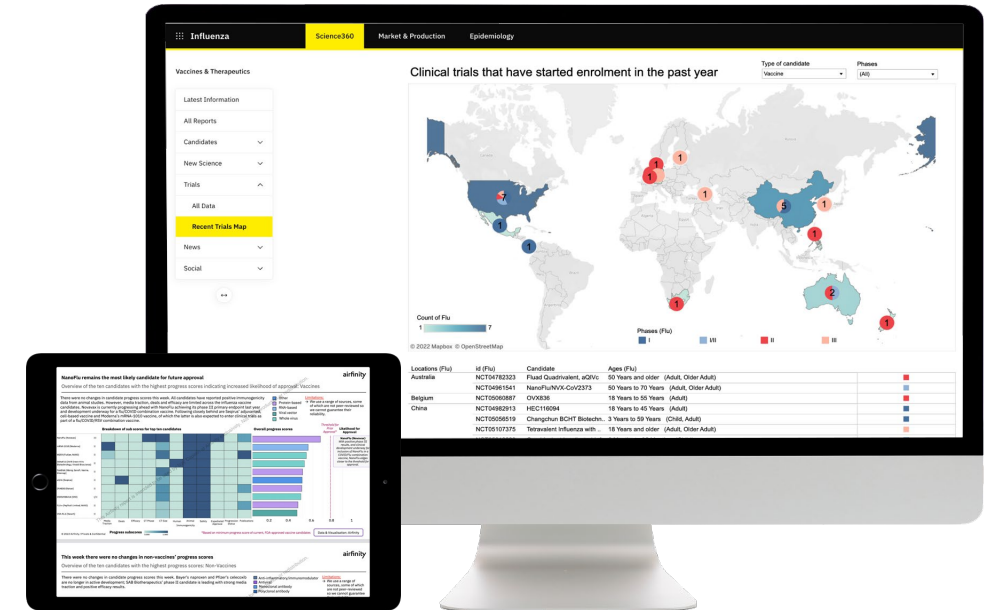
Disease outcome distributions for the USA



Our solution can support the CDC with global disease intelligence

A cloud-based data subscription

- Track global infectious disease developments
- Estimate the true burden of disease
- Forecast and simulate disease outcomes
- Use other countries as analogues to assess risks to the US
- Assess global disease risks and help inform US strategy and decision making
- Use global data forecasts to inform travel and testing as well as other protective mechanisms



Appendix

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