## Data.



The home of health data

)

The home of health data

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"Let me start with the moral centre of our work, with this simple but crucial statement: WHO's work is about serving people, about serving humanity. It's about serving people regardless of where they live, be it in developing or developed countries, small islands or big nations, urban or rural settings. It's about serving people regardless of who they are. Poor or rich, displaced or disabled, elderly or the youth. Most importantly, it's about fighting to ensure the health of people as a basic human right."

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Using data to improve health for everyone, everywhere

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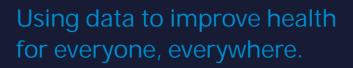
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## Introduction



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Data makes sense of a changing world. We change the world by making sense of data.

Every data point is a person. A place. An event. Every number tells a story. Or many stories.

Those who are living healthier, longer lives. Those who are sick and seeking treatment. The health workers who care for them and the country health systems that exist to serve their people.

#### Understanding and acting on health data can:

- Enable better health and well-being
- Ensure healthcare for all
- Eradicate diseases
- Protect from emergencies

The World Health Organization has the responsibility as the steward of the world's health data to make it accessible to all so that no country, no city, no community and no person is left behind.

Data helps us to identify gaps in health outcomes, address disparities and tackle inequalities in health.



Introduction

The collection, communication and use of health data has experienced a global revolution, driven by huge advances in technology and connectivity.

WHO is committed to empowering each and every country to join the health data revolution and grasp the opportunities it provides by transforming access to health data.

#### We are working globally to

- Reduce duplication in health data collections
- Collate disparate health data sources
- Improve the accuracy, efficiency and reliability of data collection, harmonization and dissemination
- Provide open-access tools to explore and analyse health data
- Equip decision makers with clear, timely information and insights



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### +3 233%

As the world reacted to the COVID-19 pandemic, Google search popularity for the word 'cases' saw a global increase of 3 233% in March 2020 from the previous five-year average. And since then has held steady at +567%.

The rise in queries for 'cases' reveals the democratisation of health data consumption. It reflects the public request for accurate, timely and reliable data so they can measure risk and make decisions.

# Inequalities in access to health data.

Public or statistician. Nurse or minister. Media or researcher. East or West. North or South. Rural or urban. Access to health data is not always equal. Access to health data is not always easy.

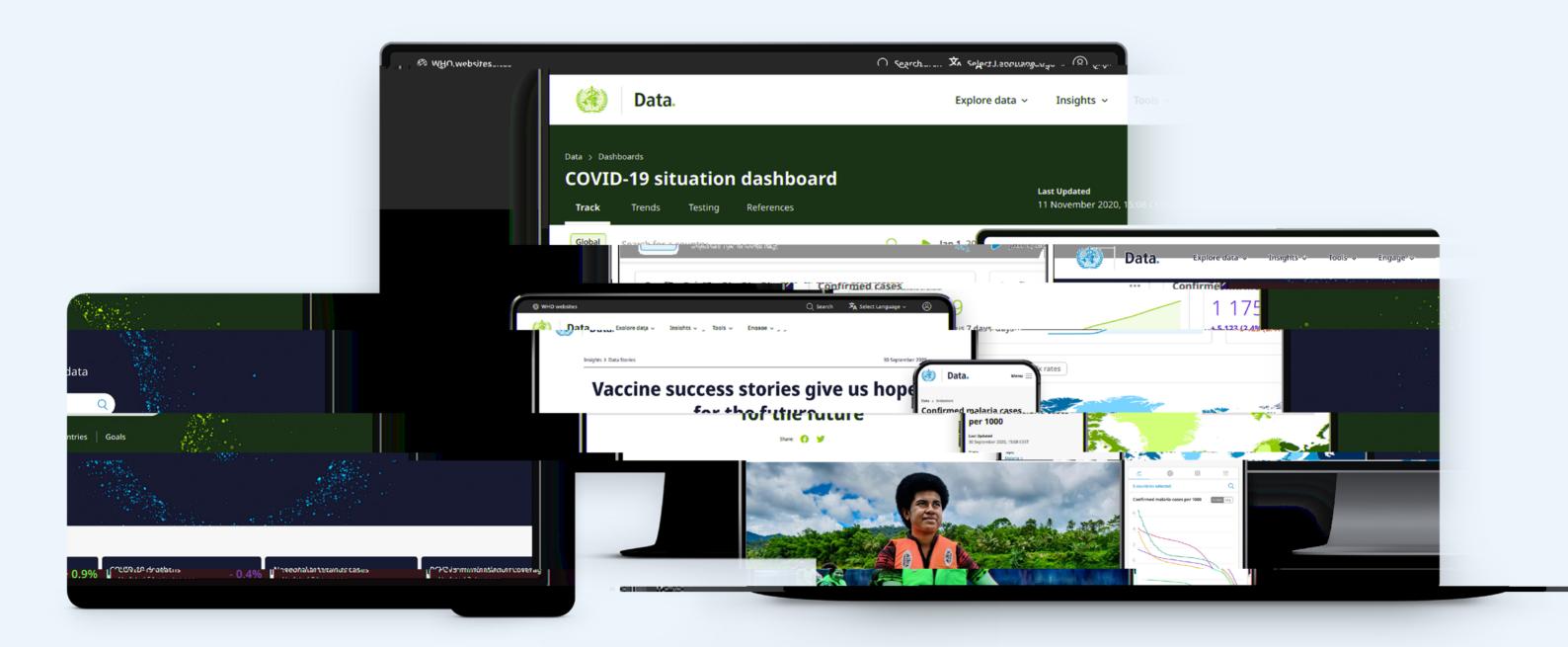
A truly accessible, trusted and actionable source for the full breadth of the world's health data simply does not exist – yet.

••••

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# Changing the world is possible

The home of health data data.who.int



Introduction

## Accessible



### Responsive

Fully responsive and built for devices of the future.



### Multilingual

Multilingual by design, catering for all languages and scripts.



### **Inclusive**

Accessible for users with visual, auditory, motor and cognitive impairment.

359.1<sub>million</sub> 75%

The home of health data

### We are making health data findable, browsable and usable.

#### **Built for everyone**

Health data is a public good and must be accessible for all. data.who.int aspires to be the most accessible, harmonized public health data platform in the world.



#### Performance

Improved speed and performance for data consumption.



### Shareable

Designed for social, embeds, apps and syndication.

0.07<sub>Mbs</sub> 4.39<sub>billion</sub>

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## Trusted

#### Accurate. Reliable. Accountable.

WHO has been working directly with countries to improve the quality of global health information since 1948. We work with our Member States and trusted partners to report data that is accurate and reliable.

All data WHO collects is stored, analysed, validated and used in accordance with international standards and best practices in health data management.

WHO's Data Principles provide a foundation for continually reaffirming trust in the information and evidence on public health we provide.

- WHO shall treat data as a public good
- WHO shall uphold Member States' trust in data
- WHO shall support Member States' data and health information systems capacity
- WHO shall be a responsible data manager and steward
- WHO shall strive to fill public health data gaps

WHO has harmonized data sources across its 194 Member States, ensuring health estimates and statistics are comparable across the world, and charting progress towards common, global goals such as the SDGs.

"Trust is the DNA of our work. If people lose trust in official numbers, then we lose everything."

#### **Dr Samira Asma**

Assistant Director-General for the Division of Data, Analytics and Delivery for Impact, World Health Organization



## Actionable

### data.who.int is built to transform lives.

We complement data with meaning, giving the necessary information for action to:

- Shape public policy
- Respond to health emergencies
- Allocate healthcare resources
- Make informed decisions

Insights gleaned from data analysis enables policy makers to better address gaps in health policy, service delivery and meet the world's most pressing needs.

data.who.int maps indicators to the Triple Billion targets and Sustainable Development Goals as well as relevant recommendations, guidelines and advice from WHO.





### The world's health data in one place

# Explore





Explore 22

# The home of health data

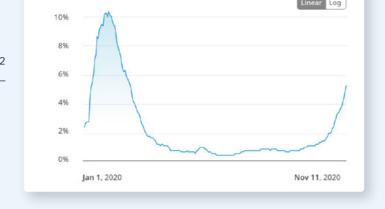
Explore the world's health data in a single place, accessing data from WHO, partners, trusted and publicly available data sources in one seamless experience.

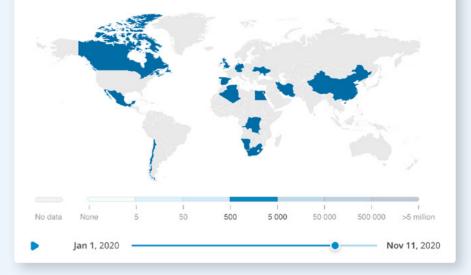
#### World class data visualization

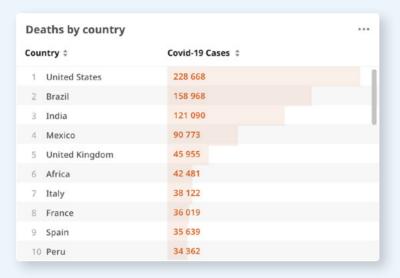
Accessible, engaging visualization and information design making data easy to understand. Users can explore data in multiple ways using a range of common views to ensure that data is accessible, usable and shareable at all times.

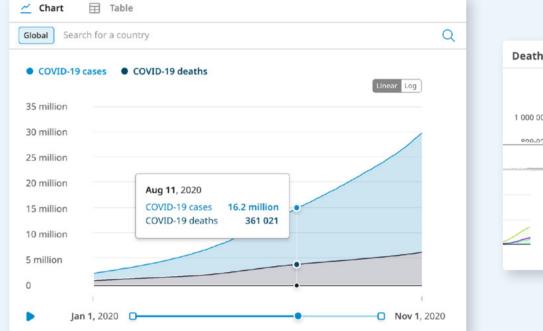
#### **Quick and scalable**

From collection to visualization, data.who.int provides faster access to data. By applying a more agile approach of reusable visualizations, we enable the creation of dashboards and portals at speed and scale.









Deaths per day

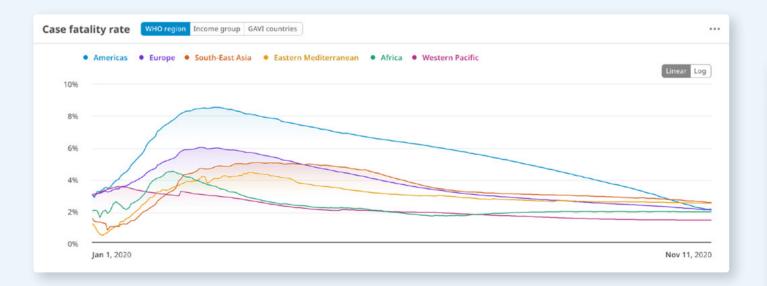
High Income
Upp
Lower middle income

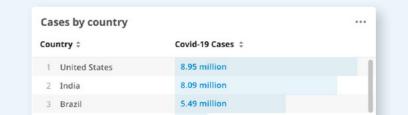
1 000 000

200 000

Jan 1, 2020

Confirmed cases ... 44 592 789 ... + 402 102 (0.9%) in previous 7 days







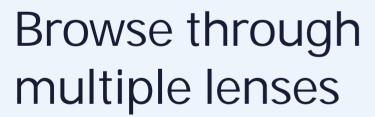
Copy to clipboard Tweet

**⊞** Table

Map

Global Search for a country

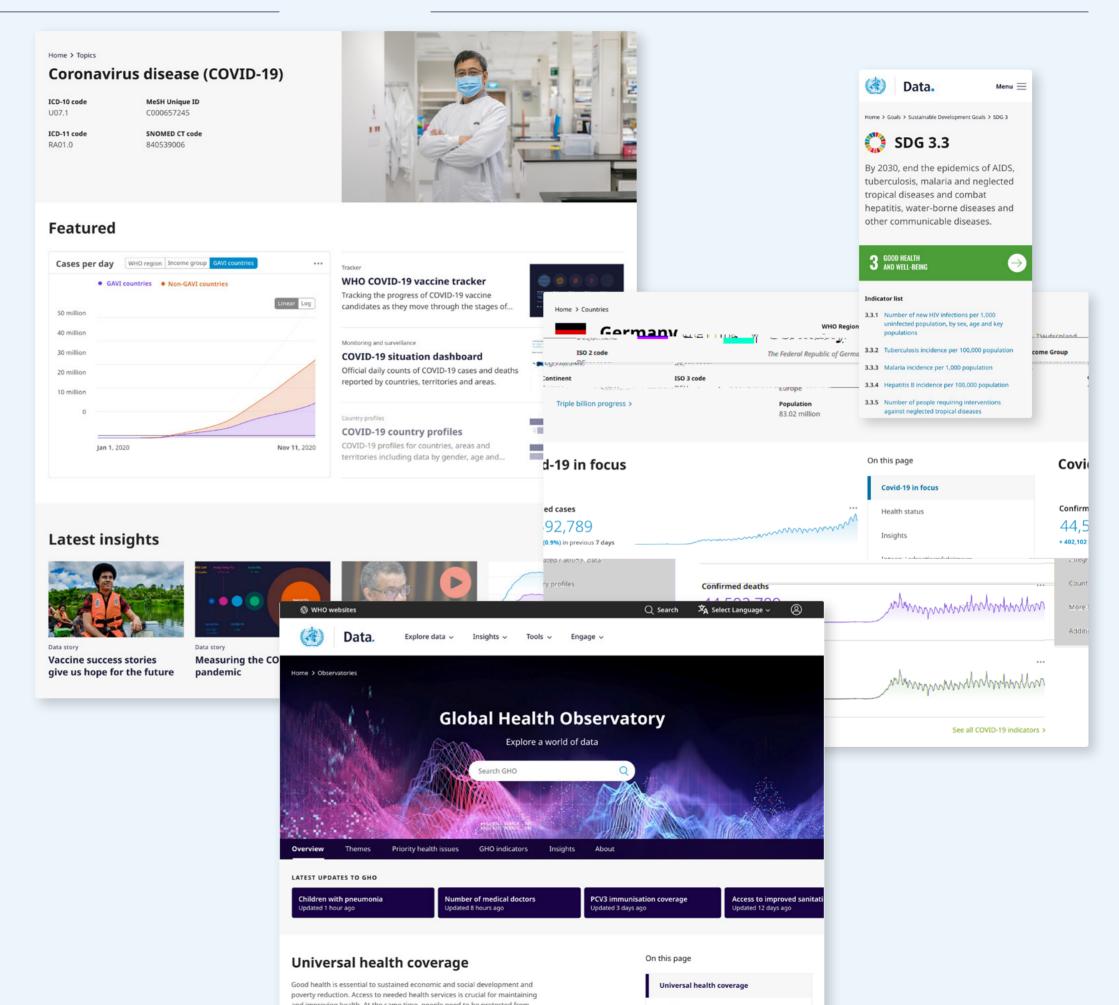
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Users can access and browse data through a range of pathways, allowing for custom themes and dashboards.

By providing a dynamic, common system, we create the backbone for publishing channels, WHO observatories and data portals.

WHO technical programmes, regional offices, country offices and partners are equipped with their own space to collate, curate and publish dashboards, insights and data assets.



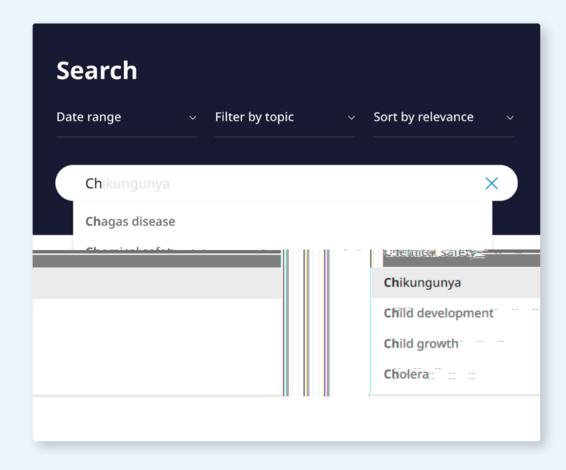
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# Explore the journey of data

By providing access to the entire data journey, a comprehensive understanding of data has never been easier.

data.who.int seamlessly maps complex relationships from dashboards and visualizations to source data. This data includes indicators, datasets, metadata, microdata, collection instruments and methodology. Users are given complete transparency to the journey of data from collection to visualization.

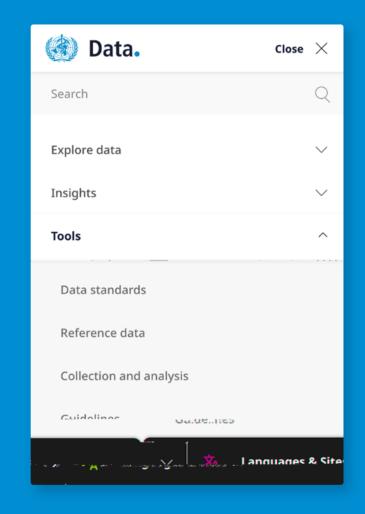
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# Smarter search

Advanced search capabilities provide users with a smarter experience, serving personalized results based on their unique needs and motivations. Features include semantic, multitenant-capable and plain language search.

Our machine learning engines analyse and track search trends to feed search data back into our algorithms, creating an ever-improving system and search service.



# Library of resources

WHO's history of global health leadership provides a wealth of flagship products and services that support Member States, partners and health professionals on the ground.

data.who.int consolidates our health data resources into a browsable library of products and tools.

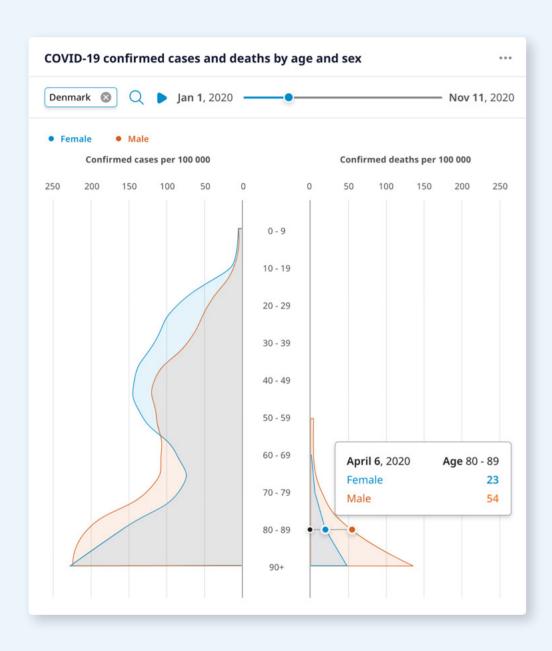


# Analyse





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### Disaggregated

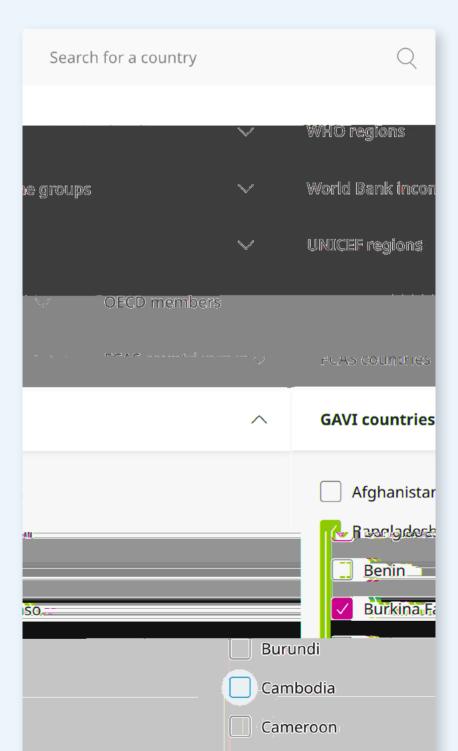
WHO is committed to addressing data gaps and revealing inequalities in health and health data.

data.who.int releases and visualizes disaggregated data, where available, by dimensions such as sex, age, economic status and education, helping to uncover gaps and implement effective policy to transform lives and communities.

### Aggregated

At country level, aggregated data can reveal patterns to inform decisions that shape our healthcare systems, national policies and international cooperation.

data.who.int allows analysis of country data based on custom selection and internationally recognized groupings.



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# Powerful comparisons

A new comparison tool allows users to quickly and easily compare data across geographies, indicators and time periods.

Common views such as chart, map and table automatically adapt to serve the best visualization for the shape and type of data being plotted.

#### **Expert analysis**

Exploring deeper relationships between indicators and data dimensions can bring greater understanding and insights that impact decision-making and policy design.

Crucially, this includes analysis across levels of disaggregated data revealing comparisons and trends at, or between national, subnational and demographic levels.

WHO's technical programmes, data managers and world leading experts analyse and release data visualizations that reveal correlations, causal relationships, comorbidities, confounders and risk factors.



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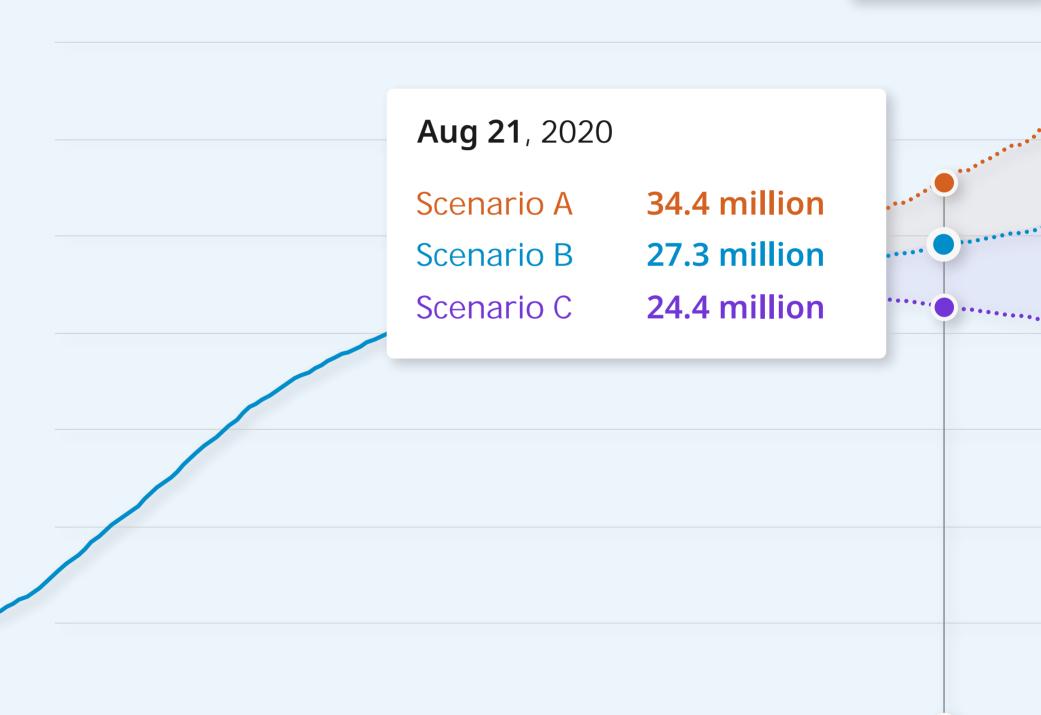
# Health forecasting

Linear Log

Predictive analytics, forecasting and simulation modelling built on the foundation of reliable data.

data.who.int provides countries and the global health community with forecasting scenarios that facilitate intervention strategies from health promotion and prevention to emergency risk management, health system readiness and universal health care.

We remove bias from single predictive models by partnering with world-leading academic institutions to publish multiple forecasts, supplied with the relevant methodology, assumptions and modelling uncertainties.

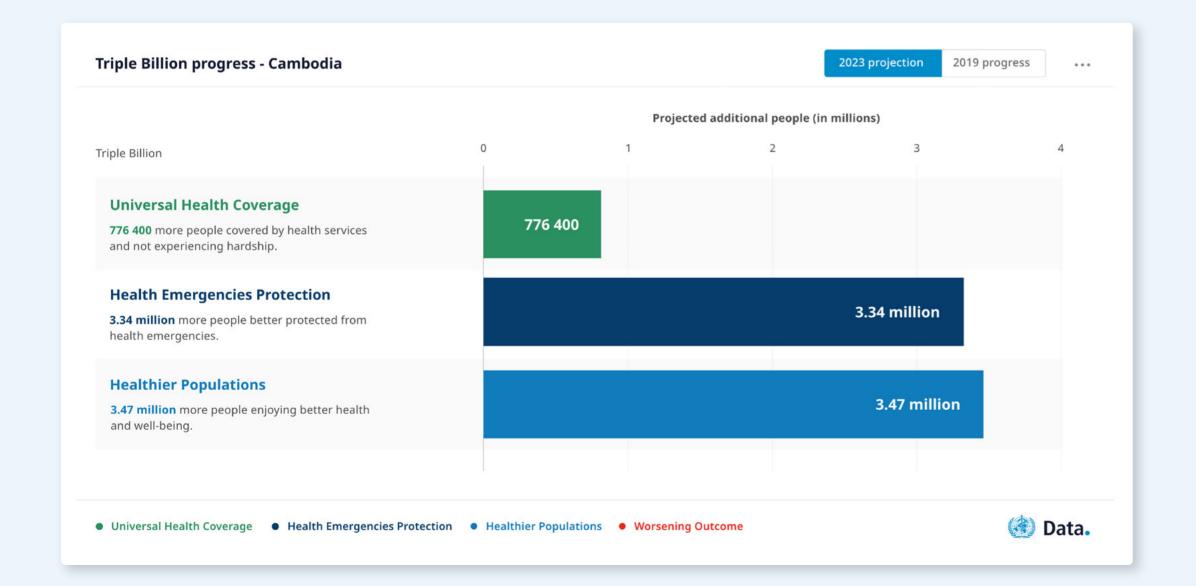


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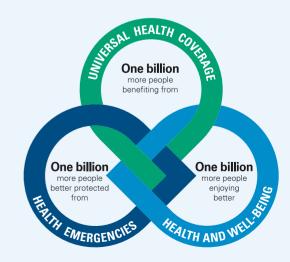
# Data to deliver impact

data.who.int tracks health indicators against global goals and targets measuring progress through regular stock takes.

As the COVID-19 pandemic impacts progress towards the 2030 Sustainable Development Goals and Triple Billion targets, data is vital in helping the global community understand where we are and interventions that can positively affect progress.







# The power of place

We make complex relationships understandable through our geospatial analysis tools.

Studying health data combined with topological, geometric and geographic spatial data properties reveals detailed patterns shaped by the contours of our world.



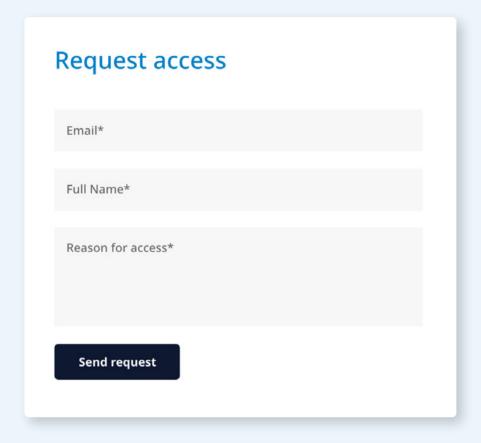
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## Thinking big

We harness the power of big data by augmenting health-related statistics with large and complex data from trusted sources.

As the measurable interactions of the world continue to increase in volume, velocity and variety, we disentangle the complexities of big data to improve its utility and understanding for the end user and value for countries.

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# Sandbox capabilities

Our data repository is readily accessible by WHO technical programmes and partners, providing a secure zone to explore our rich data sets through interaction, experimentation and collaboration.

Through data.who.int, members and institutions of the global data community can request partner-level access to an inventory of unpublished data assets held by WHO, providing opportunities to collaboratively work in a cloud-based analytics environment.

We don't just analyse data, we analyse how people use and access data

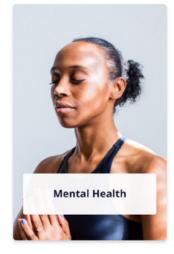
#### Creating feedback loops

By tracking the usage and consumption of all data assets, we create feedback loops with users presenting insights on most-viewed indicators, trending visualizations and most-shared data by region and country.

Understanding how people use data.who.int allows us to improve it, make recommendations to users and understand which data is trending at any given moment.

# Explore trending topics

Delve into the health data trending around the world today.







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# Telling stories of data, from data, about data

Understanding the narratives and voices behind the numbers helps us make sense of things.

Our engaging editorial and analytical content provides users with world-class data commentary, information design and data journalism where trusted sources and analysis are at the heart of the story.



MHO websites

Insights > Data Stories

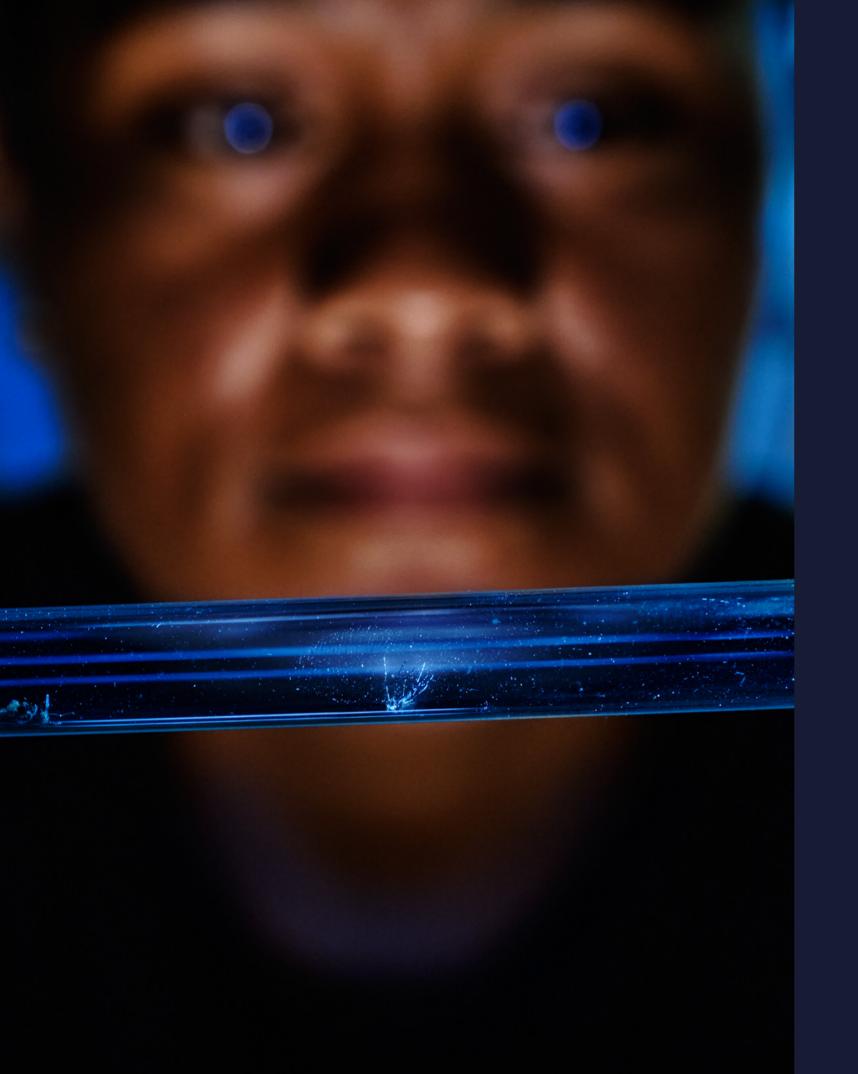
Q Search ★ Select Language ∨

30 September 2020



## Personalize





Personalize 50 The home of health data 51

# Customized experience

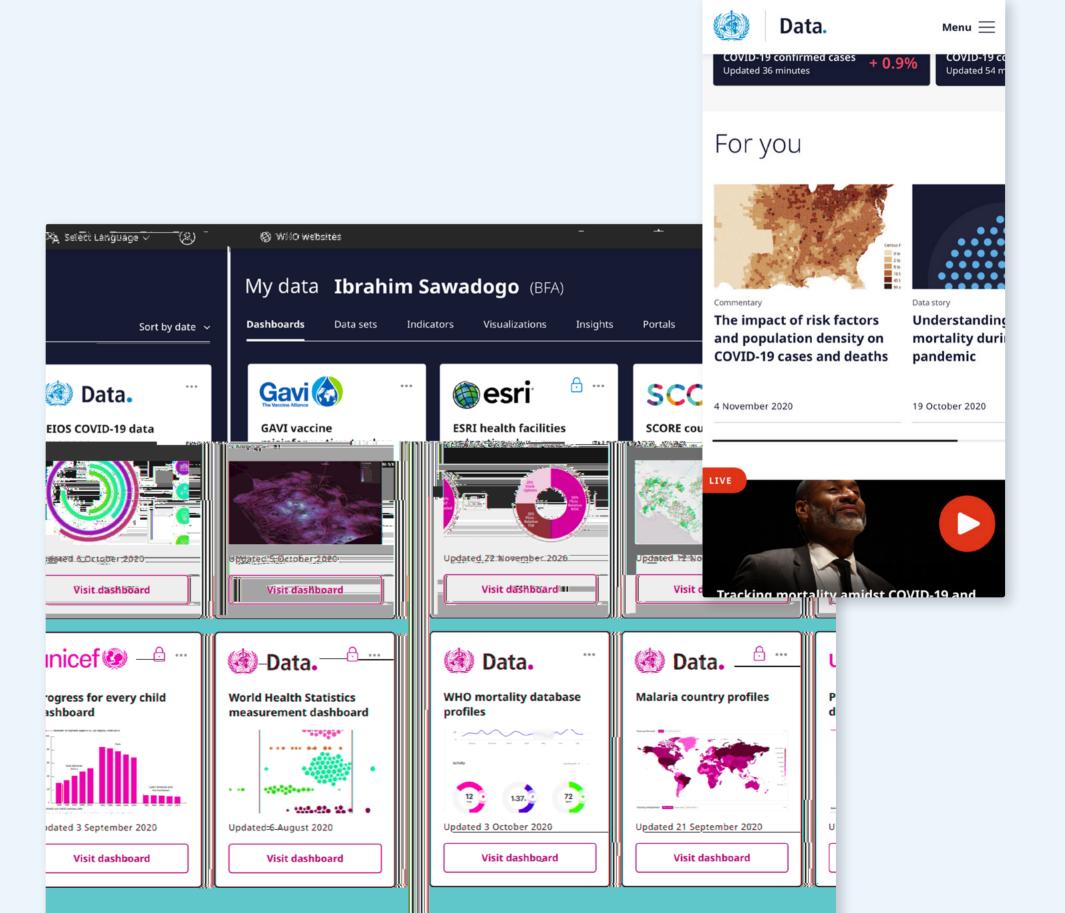
Combining the history and preferences of users with machine learning algorithms and our expert knowledge of the data, we tailor the experience of data.who.int to individual needs and requests.

Our advanced and extensive filtering system allows for further refinement and customization directly controlled by users to aid with queries and discoverability of data.

#### Login and subscribe

We invite users to login and subscribe to health data channels through the lenses of location, theme or publisher. Users can designate favourite indicators, dashboards and data sets for quick reference and receive alerts when changes or updates are made to the underlying data.

Customized dashboards are available for logged-in users with additional permissions providing access to private dashboards and non-public data including Triple Billion progress.



Personalize 52

### Trigger alerts

Request custom alerts for an indicator or visualization by scheduling triggers based on your requirements.

#### **Threshold alerts**

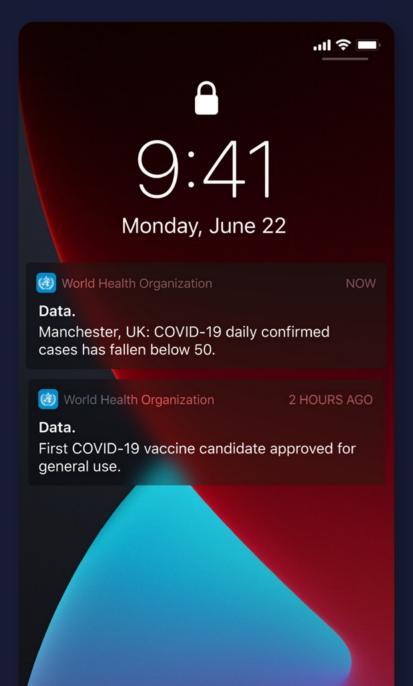
Notify me when a data value passes a specified threshold.

#### Rank alerts

Notify me when the rank of a dimension value changes, passes a threshold or passes another value.

#### **Time-series alerts**

Notify me at a specified period of time based on these parameters.



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# Schedule notifications

We provide a system-wide, explorable calendar of data releases populated with the scheduling of annual, monthly and all other collections, mapped to indicators and visualizations.

Schedule diary events or request notifications for data updates by a preferred method and device.

data.who.int keeps you informed

07

Monthly update

**Measles and Rubella** 

10 AM GMT

July **15** 

WHO / UNICEF

Immunization coverage estimates

1 PM GMT

May 13

Statistics report

**World Health Statistics** 

11 AM GMT

Dec **09** 

Report

**Global Health Estimates** 

8 AM GMT

Dec

Statistics report

**Global Health Workforce Statistics** 

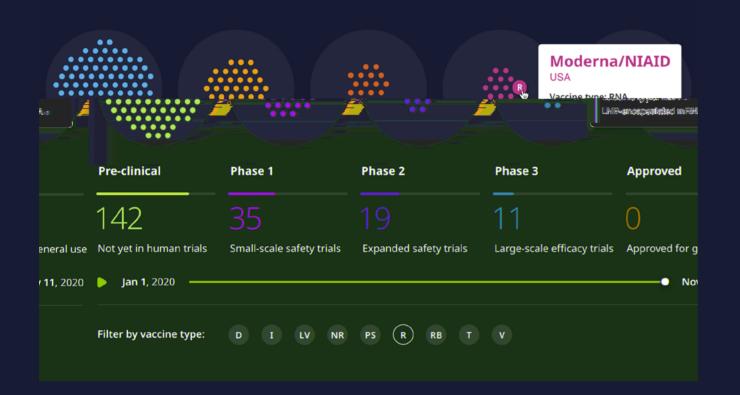


## An accelerator for discovery and innovation

# Innovate



Innovate 56



# Accelerating progress

Accurate and complete data is essential for sound decision making on health spending, for responding to countries' specific health needs, and for measuring progress and impact of health programmes.

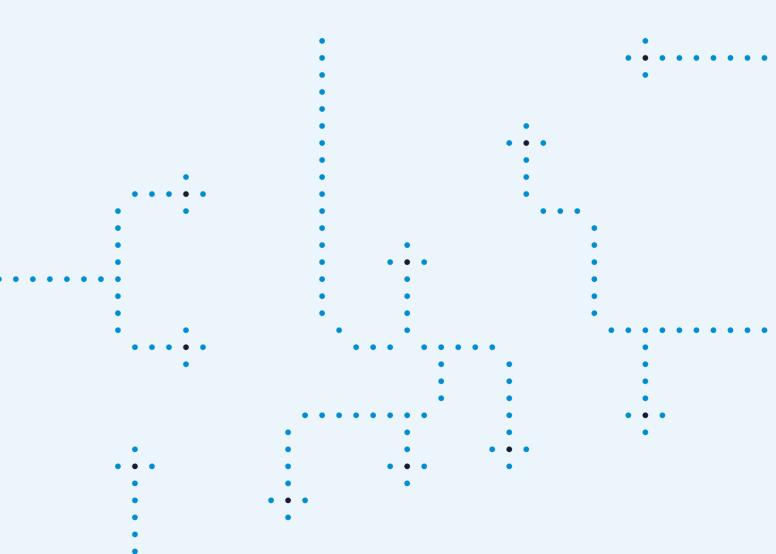
The launch of data.who.int provides a key contribution to the SDG Global Action Plan Data and Digital Health Accelerator, helping to achieve the 2030 SDG targets.

The home of health data

# Al and machine learning

Our artificial intelligence and machine learning platform will empower data scientists with cutting edge tools for prediction, classification and natural language processing.

When these algorithms are applied to the wealth of data assets from internal and partner data repositories, social media feeds, news outlets, and other data sources, we will be able to derive insights at scale and speed to inform urgent and important policy decisions.



Innovate 58 The home of health data

Hi, how can I help?

How many Covid-19 cases have there been in Germany today?

18 487 confirmed cases

# WHO data assistant

The data.who.int smart assistant aids users with answers to requests and queries in the context of daily tasks. Providing direct data value answers to questions and signposting to data or editorial assets, our smart assistant is always available as the first point of enquiry.

#### WHO Data Help Desk

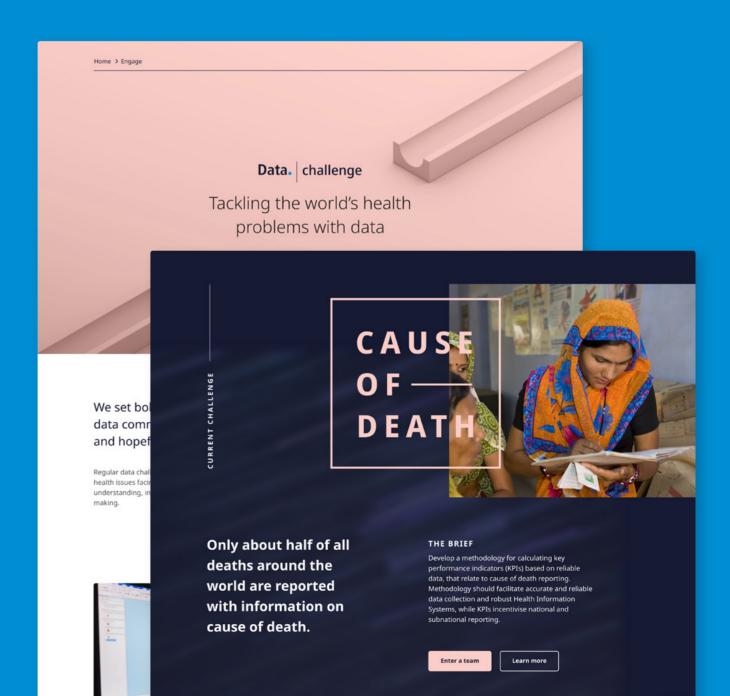
Supplementing the assistant is the WHO data help desk with a browsable knowledge base and enquiry form providing direct contact to the data managers and technical focal points responsible for every data asset and indicator.

### Data challenges

We set bold challenges for the global data community that are complex and hopeful.

Each data challenge addresses some of the largest health issues facing the world today; issues that require understanding, insight, imagination and informed decision making. Cross-disciplinary teams from around the world are given access to our data sets and data-modelling sandbox to drive insights and solve public health challenges.

Outcomes are published, peer-reviewed and made publicly available for the common good with attribution to the team and the wider community working together to achieve transformative goals.





### **Building country capacity**

The WHO Data Skills Programme is a capacity-building training course that gives analysts from Member States and partners the opportunity to develop their data science skills using data.who.int and the systems that power it.

Participants are given the opportunity to explore and experiment with new tools and techniques including:

- Advanced data visualization
- Geospatial analysis
- Machine learning
- Forecasting
- Big data

### Addressing data gaps

Through our work with countries, WHO is uniquely placed to survey the health data landscape and isolate priority data gaps to be addressed.

By working across the data community and alongside partners, WHO can provide synergy to address data gaps by targeting key areas and delivering focussed activity to raise the profile and collaboratively develop solutions.

Through hosting health data symposiums and events, publishing stories and insights, and setting data challenges and tasks given to our Al engines, we can create momentum for discovery, innovation and change.



## Sharing data has never been easier

# Share



Share 64 The home of health data 6

### Data here

All data visualizations are immediately accessible and compatible across the wider WHO digital ecosystem.

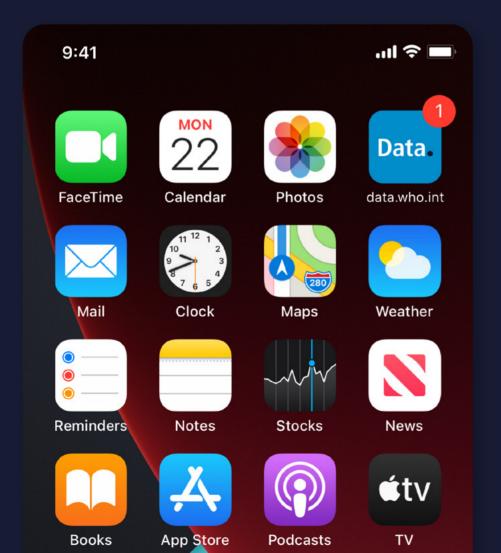
We ensure the interoperability of WHO digital systems with understandable user journeys allowing for a seamless experience between WHO websites, portals and apps.

### Data there

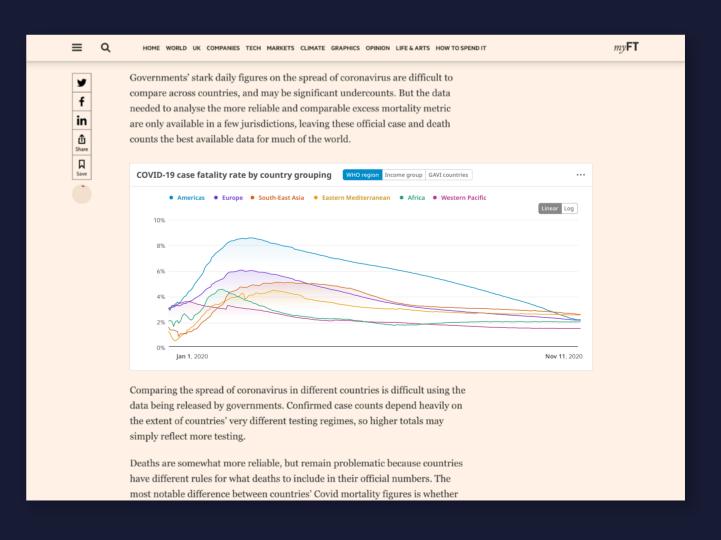
Sharing data is at the heart of our component capabilities. Our data can be found and accessed from whichever device you use.

Users can share WHO-published data visualizations on any other website, news story or digital publication with a direct route back to data.who.int for further information.

Uniquely resourcing countries and supporting national capacity, our Member State dashboards can be fully integrated into official government websites for more efficient data dissemination.





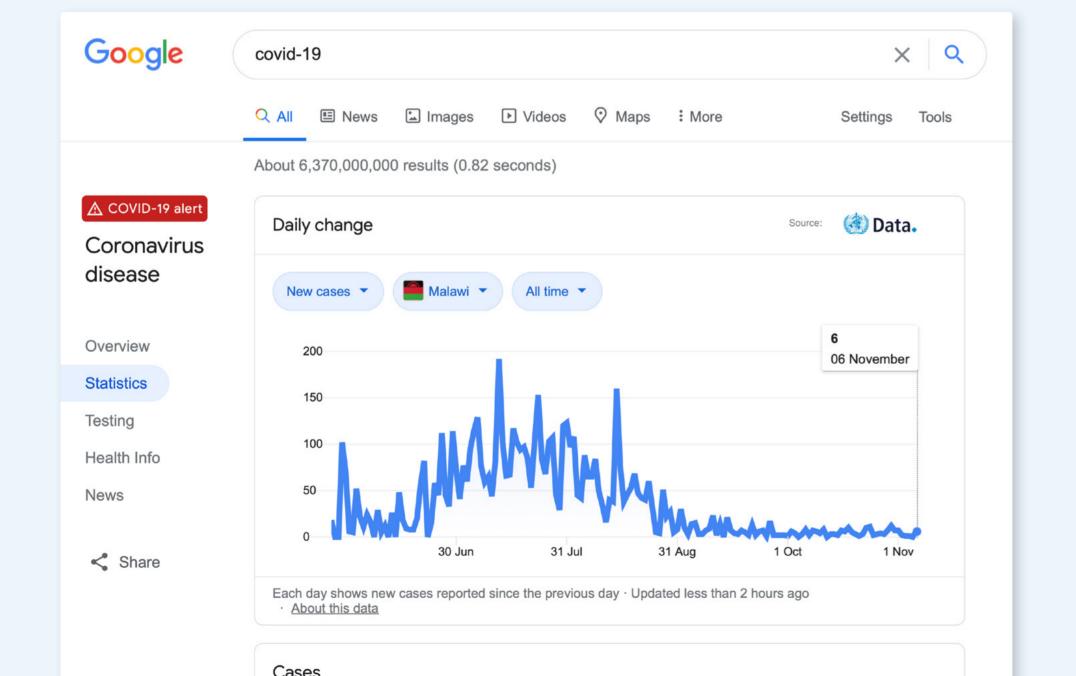


Share 66 The home of health data 67

### Data anywhere

We structure our public data assets to power ground-breaking digital partnerships that enable data content to be leveraged and shared with a wider audience.

Our content is structured for syndication and consumption allowing search engines, applications and other products to share accessible, trusted and actionable health data natively; extending its reach and impact, and linking back to its WHO source.



### Open data

WHO's first principle is to treat data as a public good. We advocate and build upon open data and open source solutions making every effort to release data publicly and to share when safe and ethical to do so. Unless there is a legitimate justification to the contrary, WHO ensures data is open and accessible to the public in line with this principle.

We also commit to bilateral approaches that address open data challenges and ensure we are transparent about how data is collected, used and shared while protecting the privacy of an individual or sensitive information.

To ensure the interoperability of our data to be consumed and used by other diverse systems and organizations, data.who.int lays a foundation for:

- Availability and access
- Reuse and redistribution
- Universal participation



## Building a community that learns together

# Engage



Engage 70 The home of health data

# Fostering community

We open our doors, as well as our data, in our commitment to working with others.

We leverage data.who.int to build and nurture a community around health data; fostering ideation, facilitating innovation and increasing capacity across the field.

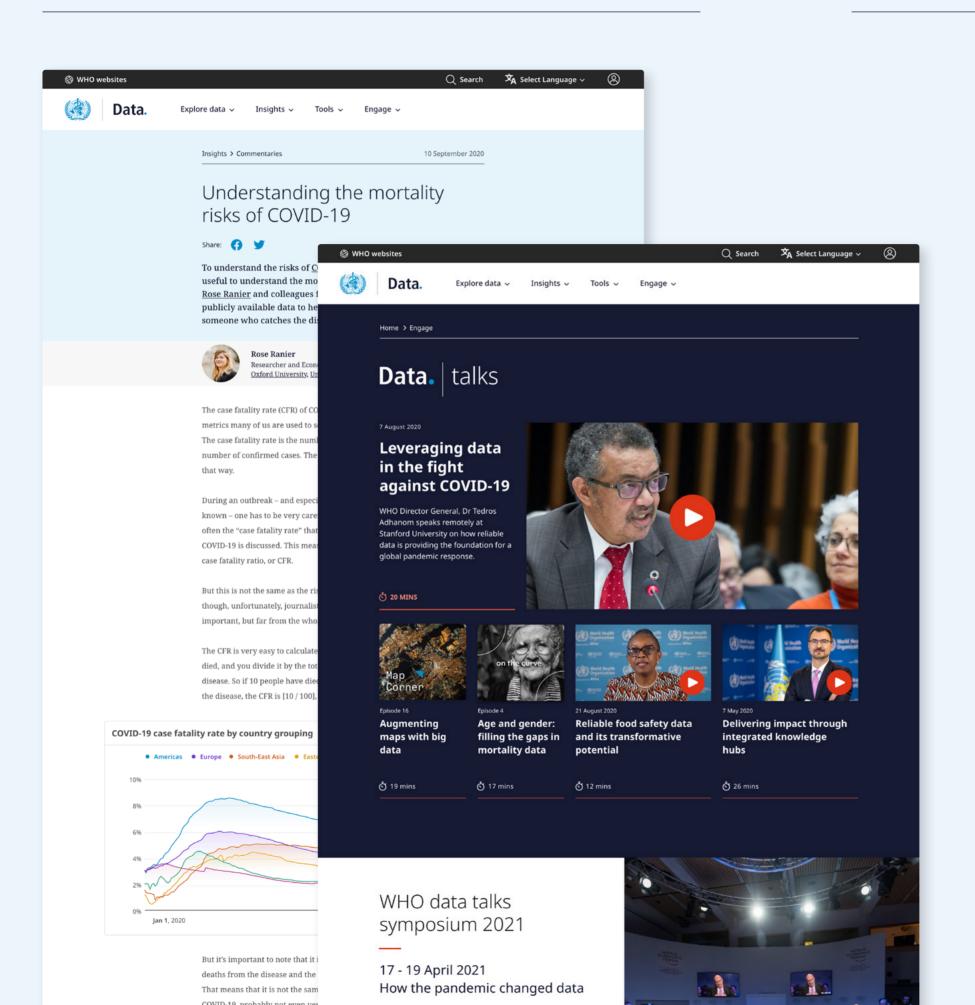
As we innovate to tackle some of the world's greatest challenges, community is at the heart of our approach. We continually seek to strengthen, resource and learn from those around us, utilising data to better the lives of others.

"Together, we need to accelerate the implementation of transformation, even as we continue to learn and add new ideas."

**Dr Tedros Adhanom Ghebreyesus** World Health Assembly Nov 2020



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# Thought leadership

Our editorial and analytical content provides users with engaging, world-class data commentary, research and data journalism.

data.who.int provides a curated publishing space inviting respected thinkers, experts and practitioners to share insights and ideas to inspire, challenge and further the discussion.

By providing a space to cultivate progressive learning, we aim to sharpen our response to data challenges by utilizing best practices and initiating new ideas.

The value of discussion and debate, of big ideas and new concepts, of conversing and conferring, are championed by our Data.talks events and resources.

The Data.talks media library provides free access to our catalogue of video and audio resources from events and interviews while our commissioned podcast series hosts voices and stories that motivate and inspire.

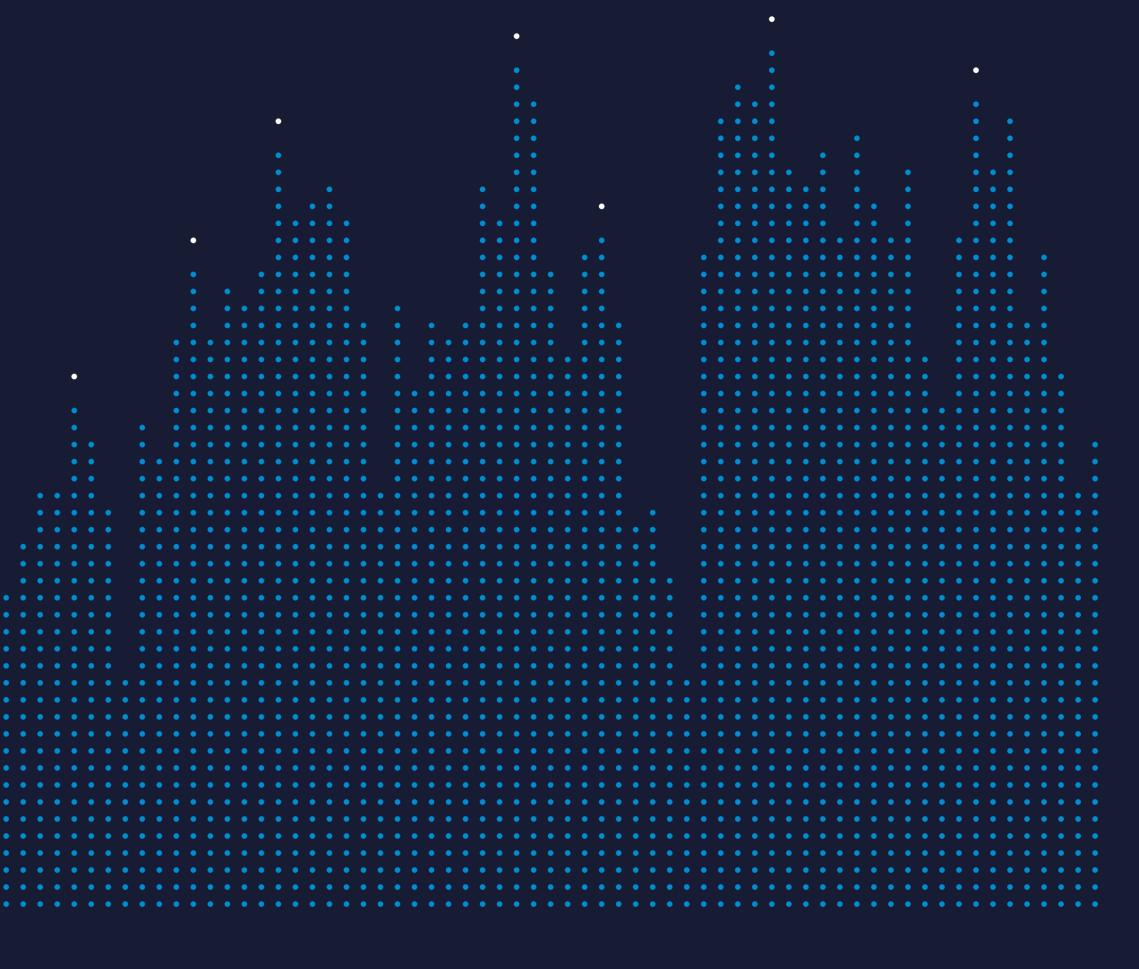
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# Measured impact

We measure impact by engagement and transformation using a combination of indepth, carefully calibrated qualitative and quantitative techniques.

This includes measuring engagement at every digital touchpoint: visualizations, shares, exports, API calls, embeds and more.

By measuring impact alongside consumption and application, we build a broader picture that speaks to increased capacity, country resourcing and transformation.





# Powered by





78 The home of health data Powered by

## Country Portal



#### Manage all data requests in one place

The WHO Country Portal is the transformative solution for data collection and consultation with countries, areas and territories allowing Member States to manage all health data requests from WHO.

#### **Seamless processes**

Member States can directly upload data and access restricted data for verification, consultation and approval. The two-way portal facilitates data, document and communication exchange, creating frictionless processes in a centralized, secure environment across all levels of WHO and our data collection partners.

#### Customized

Partners and countries have quick and easy access to the latest data and information including custom dashboards and datasets utilizing our state-of-theart data visualization tools. Dashboards and visualizations can also be integrated into other country and partner digital environments.

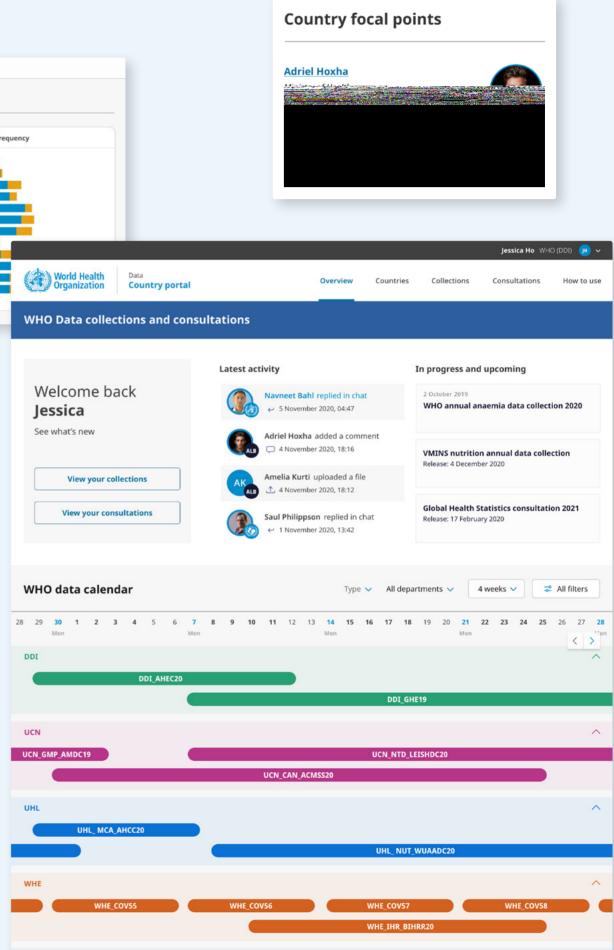
Data collections
 Data consultation:

#### **Integrated systems**

WHO's reducing data burden roadmap plans for the further integration of complex data processes and information systems whereby existing national health information systems and mobile collection systems feed data directly into the Country Portal.

#### Interoperability

The interoperability of data.who.int functions creates a streamlined ecosystem where metadata and reference material from the country portal forms the basis for microdata that is made publicly available at a later date.



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## Central Data Repository

The WHO Central Data Repository is a world-leading technical solution for the management and storage of health data; ingesting, harmonizing and processing data with built-in metadata management and governance process standards.

The repository forms the foundation that powers the experiences of Member States, partners and stakeholders across public-facing interfaces while serving WHO data managers with further tools and functionality:

- Data protection, governance, publishing and discovery
- Data pipeline authoring
- Sandbox environments
- Data infrastructure as a platform
- Cloud scale

The repository centralizes WHO and external data for common use, ingesting from WHO's internal applications, partner organizations and real-time big data sources.



#### **Data Source**

Data is collected from different sources



#### **Drop Zone**

Intermediate storage for raw data



#### **Bronze**

Raw data without transformations



#### Silver

Easy to consume data sets



#### Gold

Data ready for publishing



#### Platinum

Easy to combine data from various initiatives



#### **Public Portal**

Data is available for internal and external users Credits

### With thanks to the following organizations for their input and support

- BBC
- Deloitte
- ESRI
- Google
- Information is Beautiful
- Our World in Data
- Oxford University
- Set Reset
- She Was Only
- The Susan Thompson Buffett Foundation
- WAIVE
- World Bank
- World Data Lab

#### Special thanks to our development partners for their foundational work on data.who.int, Country Portal and Data Repository

- Avanade
- e-Zest
- Kore
- Microsoft

### Thanks to the WHO regional offices for their continued input and support

- Regional Office for Africa
- Regional Office for the Americas
- Regional Office for the Eastern Mediterranean
- Regional Office for Europe
- Regional Office for South-East Asia
- Regional Office for the Western Pacific

### With thanks to the following Member States who have used and provided feedback on the Country Portal

- Iceland
- Kenya
- Lebanon
- Micronesia (Federated States of)
- Norway
- Saudi Arabia
- Seychelles
- Singapore
- TurkeyUnited Arab Emirates (the)
- United Kingdom of Great Britain and Northern Ireland (the)
- Uruguay

#### WHO Expert Advisory Think Tank

In striving for excellence, WHO has established an advisory think tank inviting global experts to advise and support the continued development of data.who.int.

For more information or to partner with us, please contact onestopdata@who.int

#### **Photo Credits**

- **4** © WHO / Sebastian Meyer WHO Mobile Clinic in Duhok
- 7 cc Unsplash / @tbelabuseridze Preparing for the Nyepi day ceremony. Ubud, Indonesia
- **18** © WHO / Lindsay Mackenzie 16 September 2020: A nurse works in the room of a COVID-19 patient at the St. Orsola-Malpighi Polyclinic in Bologna, Italy.

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- **20** © WHO / Rob Holden WHO Ebola response Incident Manager, Abdou Salam Gueye on a helicopter.
- **30** © WHO / Blink Media Nana Kofi Acquah Kenneth Owusu Frimpong, a Disease Control Officer, delivers COVID-19 samples for testing at the Veterinary Services Directorate in Accra, part of which has been repurposed to provide COVID-19 testing services.
- **40** Satellite map of European cities night. N.A.S.A. Image modified.
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A team of health workers provide vaccination outreach service to remote villages in Fiji.

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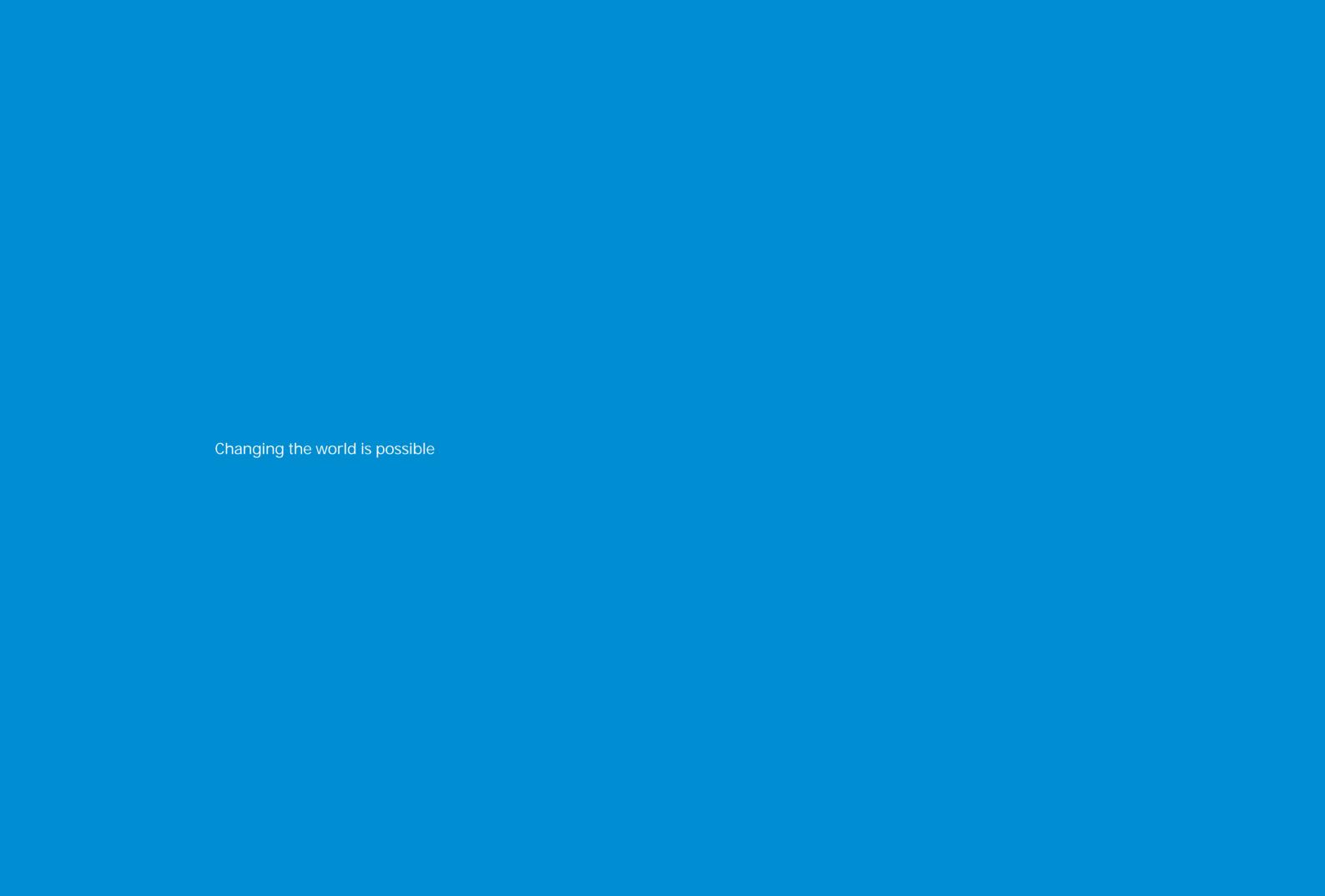
A community health worker takes samples of mosquitoes collected from communities which is part of controlling vector-borne diseases at a hospital in Tuvalu.

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- **71** cc Unsplash / @alexmotoc Panel moderator.
- **76** © WHO / Rob Holden WHE Communication Officer, Lindsay Mackenzie.
- **83** © WHO / Blink Media Lisette Poole Fabiana Zepeda Arias is the chief of nursing programs for the Mexican Institute of Social Security (IMSS).







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