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## **June COVID-19 Report**

### **How Quantzig's big data analytics solutions can help the chemical industry to boost operational efficiency – April 30, 2020**

<https://www.businesswire.com/news/home/20200430005345/en/COVID-19-Insights-Quantzig%E2%80%99s-Latest-Success-Story-Reveals>

- Quantzig is a global data analytics and advisory firm that delivers actionable analytics solutions
  - o They have offices in the US, UK, Canada, China, and India
  - o Firm consists of 120+ clients which includes 55 Fortune 500 companies
- Company website: <https://www.quantzig.com/services/big-data-analytics>
- The company conducted a case study that focused on how coronavirus is impacting businesses across geographies
- The COVID-19 pandemic is bringing about severe budgetary strains in the economy and companies are being forced to scale down operations to balance the financial impact of the crisis
- Quantzig's COVID-19 business support solutions can help chemical companies by:
  - o Offering specially curated analytics solutions that focus on ensuring business continuity to help businesses navigate the crisis
  - o Offering access to a library of best practices and analytics methodologies that can help businesses carry out operations smoothly by identifying the COVID-19 impact areas
  - o Offering services that involve combinations of components like portal access, ad-hoc/steady projects, and consulting services
- In the chemical industry, raw materials prices have started varying and customers' demands have increased due to the pandemic
- Quantzig's big data analytics solutions can help clients:
  - o Analyze their customers' preferences and buying patterns
  - o Drive profits
  - o Minimize supply chain costs
  - o Identify industry trends
- Quantzig claims that its advanced analytics platforms ensure complete visibility into business and supply chain operations and thus empowers businesses to enhance efficiency
  - o Their advanced analytics platforms are also designed to support the unique needs of clients from different industries
- Quantzig's big data analytics capabilities include:
  - o Sensor data analytics
  - o Data integration and visualization
  - o Manufacturing analytics
- Their big data analytics can help clients break data silos and unearth valuable insights to act upon and identify future trends and drive growth



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- Their interface makes it easier to integrate and analyze data from disparate sources, offering a unified view of organizational data sets
- It is predicted that 2020 will bring new challenges such as data complexities, rise in competition, and stringent regulations to the chemical industry

### **Predictive analytics models help plan for COVID-19 demands – April 29, 2020**

<https://healthitanalytics.com/news/predictive-analytics-models-help-plan-for-covid-19-demands>

- With the pandemic, organizations are increasingly turning to real-time analytics tools to help track and predict healthcare demands
- Cleveland Clinic and SAS has created predictive analytics models that help forecast patient volume, bed capacity, ventilator availability, and other metrics
- The predictive models provides timely, reliable information for hospitals and health systems to optimize care delivery for COVID-19 and other patients
- The analytics models create worst-case, best-case, and most-likely scenarios, unlike other forecasts that focus on a prediction based on a single set of assumptions
- The model adjust in real time
- After reviewing possible COVID-19 surge scenarios generated by the models, Cleveland Clinic prepared for its worst-case scenario
  - o They built a 1000—bed surge hospital on its education campus for patients who don't need ICU care
- The models are being share publicly so health systems and government agencies globally can use them
  - o Models are freely available via GitHub
- They hope others will contribute their ideas and improvements to the models
- At the center is an epidemiological Susceptible, Exposed, Infected, and Recovered (SEIR) model, developed by Cleveland Clinic and SAS
  - o This is based on a University of Pennsylvania open source model that has been recorded and expanded on the SAS analytics platform and continuously improved with real-time feedback from Cleveland Clinic epidemiologists
- In March, Definitive Healthcare and Esri launched a data platform that allowed users to analyze and track US hospital bed capacity and potential geographic areas of risk
- Researchers from RAND Corporation also recently released an interactive tool that allows decisionmakers to estimate current care capacity and explore strategies for increasing it
  - o Based off inputs such as baseline number of beds, critical care doctors and nurses, respiratory therapists, and ventilators
- Predictive modles and other advanced analytics tools will likely play a critical role in measuring and mitigating the impact of the virus through this pandemic



**Google's new coronavirus update: Location data reveals impact on people's habits in your area – April 3, 2020**

<https://www.zdnet.com/article/googles-new-coronavirus-update-location-data-reveals-impact-on-peoples-habits-in-your-area/>

- Google has released COVID-19 Community Mobility Reports that shows the impact the coronavirus outbreak has had on travel to work, transit stations, parks, retail outlets, and grocery stores
- This is meant to help public health officials understand how populations are responding to social distancing
- The first report covered 131 countries and regions and included a graph that takes February 16 as the baseline for normal activity and tracks changes in movements through to March 29
- The charts that show trends over time by geography, across different high-level categories of places displays trends over several weeks with the most recent information representing 48-72 hours prior
  - o It is not publishing the absolute number of visits as a privacy measure
  - o
- This revealed striking differences between nations in when and how they implemented lockdowns or began recommending social distancing
- In the US, between March 8 and March 29, visits to retail and recreation places had fallen 47%, parks 19%, and workplaces 38%
- In countries such as Italy and Spain, retail and recreation visits were down by 94%
  - o In Italy, visits to parks also fell 90% and to workplaces, 63%
- UK
  - o Retail and recreation – down 85%
- Australia
  - o Retail and recreation – down 45%
- Sweden
  - o Retail and recreation – down 24%
  - o Parks – up 43%
- Norway
  - o Retail and recreation – down 65%
- South Korea – has a strategy for rapid testing
  - o Retail and recreation – down 19%
  - o Parks – up 51%
- Germany
  - o Retail and recreation – down 77%
- India – went into a sudden 21-day lockdown on March 25
  - o Retail and recreation – down 77%
- As travel restrictions were set to go into place, many places saw a surge in grocery store visits
- There were no reports for China and Iran as Google services are blocked



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- Google's mobility reports also show state-level movement trends
- They believe that these reports can help shape recommendations on business hours and inform delivery-service offerings
- These reports are based on data from apps such as Google Maps and devices that have enabled Location History
  - o Technical measures were put in place to ensure that no individual could be identified through the new reports
- Google shared the report a day after EU justice chief Vera Jourova asked tech companies to share more data with scientists to fight the new coronavirus
- They have not shared how frequently they will release the reports
- Countries such as China, Singapore, and South Korea have asked residents to use apps and other technology to track their compliance with quarantines
  - o Privacy activists argue that such measures can compromise individual liberties
- Infectious disease specialists say that analyzing travel across groups using variables such as age, income, and other demographics could help shape public service announcements
- Google has said that it is not reporting demographic information and has declined to comment on whether it has received any legal requests to share more detailed data to help with efforts to tackle the pandemic
- Facebook Inc, has shared location data with non-governmental researchers that are producing similar reports for authorities in several countries
  - o They have not however published any findings
- There are concerns surrounding the legality of Google's processing of location data and the transparency surrounding that processing
- Google also announced that they will be collaborating with epidemiologists working on COVID-19 with updates to an existing aggregate, anonymized dataset that can be used to better understand and forecast the pandemic

### **Twitter launches a COVID-19 data set of tweets for approved developers and researchers – April 29, 2020**

- Twitter has made it possible for developers and researchers to study the public conversation around COVID-19 in real time with an update to its API platform
- The company is introducing a new COVID-19 stream endpoint to those participating in Twitter Developer Labs – a program that offers access to new API endpoints and other features ahead of their public release
- The new COVID-19 endpoint will allow approved developers to access COVID-19 and coronavirus-related tweets across languages
  - o This will result in a data set that will include tens of millions of tweets daily
- The data can be used to research a range of topics related to the coronavirus pandemic
  - o Ex. the spread of the disease, the spread of misinformation, crisis management within communities



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- Developers can also use the new data set to build machine learning and data tools
- The company will determine which tweets qualify for inclusion in this data set based on which words are used in the tweets (ex. “COVID-19” or “coronavirus”)
  - o It will also pull tweets that use common coronavirus hashtags
  - o They will also filter this data stream to exclude spammy and low-quality content
- Access to the endpoint is free
- Twitter will hand-select which developers and researchers will be granted permission to use it
- Developers will have to inform Twitter of their project plan, detail their experience in working with big data and detail the available resources they have to process such a data set
- They have created a dedicated application to access this endpoint and will carefully review each request to ensure they support the public good
  - o In this application, they encourage applicants to describe in detail the safeguards they intend to implement to protect the privacy and safety of people represented in these data
  - o Developers will also need to have an approved developer account and adhere to the terms of Twitter’s Developer Agreement and Policy
- Apart from this, twitter has also introduced changes on its platform to make COVID-19 facts and reliable health information more accessible

### **Ontario, Canada to build big-data platform to fight coronavirus – April 12, 2020 and June 4, 2020**

<https://www.680news.com/2020/04/12/coronavirus-ontario-data-platform-research/>  
<https://news.ontario.ca/mohltc/en/2020/06/ontario-appoints-special-advisor-to-develop-health-data-platform.html>

- The Ontario government plans to create a data platform called Pandemic Threat Response (PANTHR) to help in planning for future pandemics
  - o The system is in the development phase
  - o Once it is operational, it will securely hold data from publicly funded administrative records
  - o Physician claims, medical drug claims, hospital discharge summaries and claims for home care and long-term care will be part of the system
  - o Clinical data from public health, hospital, laboratory and diagnostic imaging systems will also be included
  - o the data will be “de-identified” and has been developed in consultation with Ontario’s Privacy Commissioner
- The Ontario government appointed Dr. Jane Philpott as the special advisor to support the design and implementation of the new Ontario Health Data Platform (formerly known as PANTHR)

- This will provide recognized researchers and health system partners with access to anonymized health data that will allow them to better detect, plan, and respond to COVID-19
- This platform will also support projects from the Ontario COVID-19 Rapid Research Fund
- Researcher will be able to access the platform starting in July 2020
- Ontario Health Data Platform website - <https://computeontario.ca/covid-19-health/>

### **Tracking coronavirus using big data – April 8, 2022**

<https://www.ft.com/content/7cfad020-78c4-11ea-9840-1b8019d9a987>

- Mapping how populations move between locations has proved invaluable in tracking and responding to epidemics
  - When the WHO launched an initiative to eliminate malaria in 2007, they turned to Vodafone, the UK mobile operator, for help
  - Vodafone compiled sets of location data from mobile phones in the areas where cases of the diseases had been recorded
- The same type of think has been done to monitor other diseases including Ebola
- Thierry Breton, former chief executive of France Telecom and now the European commissioner for the internal market, has called on operators to share aggregated location data to track how the virus is spreading and to identify spots where help is most needed
- There are questions and hear around how the data might be used once the crisis is over and if these data sets are truly anonymous
- In South Korea, authorities can require telecoms companies to hand over the mobile phone data of people with confirmed infections to track their location
  - This has enabled the rapid deployment of a notification system alerting Koreans to the movements of all potentially contagious people in their neighborhoods or buildings
- China and Israel has also used personal telecoms data to trace coronavirus patients and their contacts
- The EU's General Data Protection Regulation which was adopted in 2018, also has a clause allowing exceptions for cases that are in the public interest
- The use of location to track the disease has been applied in Italy, Spain, Norway and Belgium
  - UK, Portugal, and Greece are set to follow
- Milan and Madrid telecom operators have created heat maps that show how restriction on movement are working and what effect the presence of police on the streets is having on behaviour
  - This showed that the movement of people in one city dropped 90% during the 1<sup>st</sup> week of lockdown in Spain and a further 60% of the remainder in the 2<sup>nd</sup> week
  - In Italy, the lockdown was largely ignored for the 1<sup>st</sup> week and between 800,000 and 1 million people were still travelling in and out of Milan

- In Belgium, citizens were spending 80% of their time within their home postal area and mobility went down 54%
- Telenor, a Norwegian company, has participated in big data projects to predict the spread of dengue fever in Pakistan and malaria in Bangladesh
- Knowledge about a populations' travel patterns can be vital in understanding how an epidemic spreads throughout a country
- Telefónica, Spain's national carrier which owns networks across Latin America, has been working with Facebook to use data to deal with natural disasters such as earthquakes
  - They also worked with Unicef and the University of Notre-Dame in 2017 to improve epidemiological models for predicting the spread of the Zika virus in Colombia
- Vodafone has a researcher paid for by the Bill and Melinda Gates Foundation on its data team at the London headquarters, to work on data sets providing insights to academics tracking a variety of diseases
- European telecom companies insist that the best way to track the spread of the pandemic is to use heatmaps built on data of multiple phones, when overlaid with medical data, can help predict how the virus will spread and if government measures are working
- The European Commission wants telecom companies to provide the actual aggregated data, not just access to insights from that information
- A 2019 study by researchers at Imperial College London and Belgium's Catholic University of Louvain revealed there is a way to re-identify 99.98 per cent of individuals with just 15 demographic characteristics using location data
- Germany's Robert Koch Institute has introduced an app, developed with Berlin digital health group Thryve
  - It links to fitness bands and smartwatches
  - The app will help it map the spread of COVID\_19 by monitoring anonymized data for signs of infection including an users' resting pulse, sleep and activity levels
  - The data drawn from these apps can track individual sufferers and people they have encountered via contact tracing methods
- In Singapore, the government has asked citizens to opt in to its system
- The European Commission is working on guidelines on the use of tracing apps
  - Citizens must be able to give informed consent

**University of Washington study reports 'staggering' death toll in US among those infected who show symptoms – May 18, 2020**

<https://www.washington.edu/news/2020/05/18/covid-19-uw-study-reports-staggering-death-rate-in-us-among-those-infected-who-show-symptoms/>

- A new study by the University of Washington published May 7 in the journal Health Affairs concludes that COVID-19 is more deadly than the seasonal flu



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- The national rate of death among people infected with the novel coronavirus that causes COVID-19 and who show symptoms is 1.3%, compared to 0.1% with the seasonal flu
- They also project a grim future if the US does not put up a strong fight against the spread of the virus
- If 20% of the US population becomes infected by the end of the year, number of deaths could range from 350,000 and 1.2 million
- The School of Pharmacy and Anirban Basu (author of this study) have developed a website that explores the infection and fatality rates by US counties for people with symptoms
  - Includes data from 116 counties in 33 states
  - This is not a forecasting tool but rather a projection of what is currently happening in these communities

### **Infection Control Market Projected to be worth \$58.2 Billion by 2027 – June 8, 2002**

<https://www.globenewswire.com/news-release/2020/06/08/2044748/0/en/Infection-Control-Market-Worth-58-2-Billion-by-2027-Pre-and-Post-COVID-19-Market-Analysis-and-Industry-Forecasts-by-Meticulous-Research.html>

<https://www.meticulousresearch.com/product/infection-control-market-5058/>

- According to a new market research report “Infection Control Market by Product, and End User- Global Forecast to 2027” published by Meticulous Research®, the infection control market is expected to grow at a CAGR of 13.3% from 2020 and reach \$58.2 billion by 2027
- To prevent and reduce the occurrence rate of infectious diseases, various healthcare facilities are adopting infection control methods and programs
- Nearly 70-80% of hospitals are struggling with shortage of ventilators, masks, other personal protective equipment, hospital beds, and other supplies
- Countries with high infection rates are facing huge shortfall for infection control products
- WHO estimates that 89 million medical masks will be required every month
  - To meet this demand, a 40% increase in manufacturing is expected
- They also estimate that frontline workers will need 7-10% of the world’s supply of surgical masks, and possibly more
- For examination gloves, the figure goes up to 76 million and for goggles, it is 1.6 million per month
- Government agencies in these countries are focusing on alternative ways to increase the production capacity
  - Examples:
    - As of April 2020, Ralph Lauren Corporation is ramping up production of 250,000 masks and 25,000 isolation gowns with its US manufacturing

- The federal government of Canada has encouraged the production of the PPE domestically in order to produce it at a faster rate
- As of April 2020, Lamborghini is helping with production of surgical masks and protective shields – producing 1000 masks a day and 200 medical shield a day
- In April 2020, BMW also entered the mask-making business
- In March 2020, Retailers Canada Goose Holdings Inc and Gap Inc announced to begin the production of scrubs and patient gowns
- In March 2020, Arkema S.A. (France) has repurposed a production line at a site in France in order to manufacture 20 tonnes/week of alcohol-based solutions
- In March 20, 3M Company announced to increase investments, mostly in the US to boost N95 masks production by 30% over the next 12 months
- China is the world’s largest producer and exporter of masks
  - Production of masks in normal years accounts for about 50% of the world’s output
  - 70% of which is for export
- At present, China’s production of masks has increased more than 10 times to 120 million per day
  - Still, the global supply and demand gap of masks cannot be alleviated
- China now makes 200 million face masks a day
- Sales of medical masks are up by a staggering 319 percent
- The purchase of household maintenance masks is also up by 262% and aerosol disinfectants by 32%
- US medical supplies distributed from the strategic national stockpile (April 2020)

Item	Number delivered or Currently being shipped
Surgical masks	26 million
Gloves	22 million
Face shields	5.2 million
Surgical gowns	4.3 million
Coveralls	132,000

- Due to the pandemic, there is also slowdowns in trade between countries
  - This is disrupting the supply chains of many essential commodities – COVID-19 testing kits, masks, alcohol-based sanitizers, PPEs, dress materials for frontline health workers, ventilators for patients
  -
- Based on product type, the cleaning and disinfection products segment is estimated to account for the largest share of the overall infection control market in 2020
  - Rising number of healthcare associated infections due to the unhygienic surroundings is one of the key reasons for the largest share of this market



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- There is also an increased awareness about cleaning and disinfectant environment and rising standards for effective cleaning
- The endoscope reprocessing products segment is expected to grow at the fastest growth rate during the forecast year
  - Due to the growing importance of diagnostics and therapeutic endoscopy procedures, concerns regarding surgical wound-associated infections, and technological advancement in the medical field
- Based on end user, the hospitals and clinics segment is estimated to command the largest share of the overall infection control market in 2020
  - Due to the growing incidence of hospital acquired infections and rising number of surgical procedures
  - The increasing chronic diseases associated with aging population, growing awareness among people for quality care, rising number of hospitalization due to sudden outbreak of COVID-19, and focus on reducing the healthcare burden caused due to HAIS supported the dominance of this segment
- Based on end user, the medical device companies segment is expected to grow at the fastest growth rate during the forecast year
  - Due to strict regulations for good manufacturing and packaging practices and compulsion to follow standard guidelines during manufacturing of medical devices
- North America is estimated to dominate the global infection control market in 2020, followed by Europe, and Asia Pacific
  - Growth in North America is attributed to the increasing hospital & outpatient visits, rising number of surgical procedures, growing number of HAIs, increasing healthcare expenditure, growth in the pharma & biotech industry, increasing aging population with chronic diseases, and government initiatives to reduce HAIs & implement effective infection control practices
- Asia Pacific region however is expected to grow at the fastest CAGR during the forecast period
  - Factors driving the growth of the Asia Pacific infection control market are accelerated economic growth of many countries, growing government focus on healthcare sector, rising prevalence of infectious diseases including COVID-19, and government initiatives for boosting production of infection control products.
- Key operators in this market:
  - STERIS plc. (US)
  - Cantel Medical Corp (US)
  - Genting AB (Sweden)
  - Ecolab (US)
  - 3M (US)
  - Advanced Sterilization Products (US)
  - MMM Group (Germany)
  - MATACHANA group (Spain)



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- Belimed (Switzerland)
- MELAG Medizintechnik GmbH & Co. KG (Germany)
- and more

### **WHO warns world in ‘new and dangerous phase’ of pandemic – June 19, 2020**

<https://www.ctvnews.ca/health/coronavirus/who-warns-world-in-new-and-dangerous-phase-of-pandemic-1.4991762>

- Scientists warn that while people are growing tired of lockdowns, the diseases continues to spread with accelerated speed
- Italian researchers discovered genetic traces of SARS-CoV-2 in samples of wastewater collected in Milan and Turin at the end of last year and Bologna in January
  - Yet, their first confirmed cases were not until February
- Leaders of European countries held a virtual summit on June 19 on the European Commission’s proposal for a 750 billion euro rescue fund
  - However, they fell short of reaching a deal on a plan
- Chinese authorities said that studies of genome data, suggest the new outbreak in Beijing “came from Europe” but is different from what is currently spreading there
  - They raised the possibility of the virus lurking in imported frozen food or in the wholesale market itself, resulting in similarities to older strains

### **Key model predicts 170,000 US Coronavirus Deaths by October – June 11, 2020**

<https://www.usnews.com/news/health-news/articles/2020-06-11/us-coronavirus-infections-top-2m-key-model-predicts-170-000-deaths-by-october>

- The new forecast from the Institute for Health Metrics and Evaluation at the University of Washington predicts that the coronavirus will kill nearly 170,000 Americans by early October (possible range, 133,201 and 290,222)
  - A second wave of the virus is expected in September
  - the forecast used data through June 6

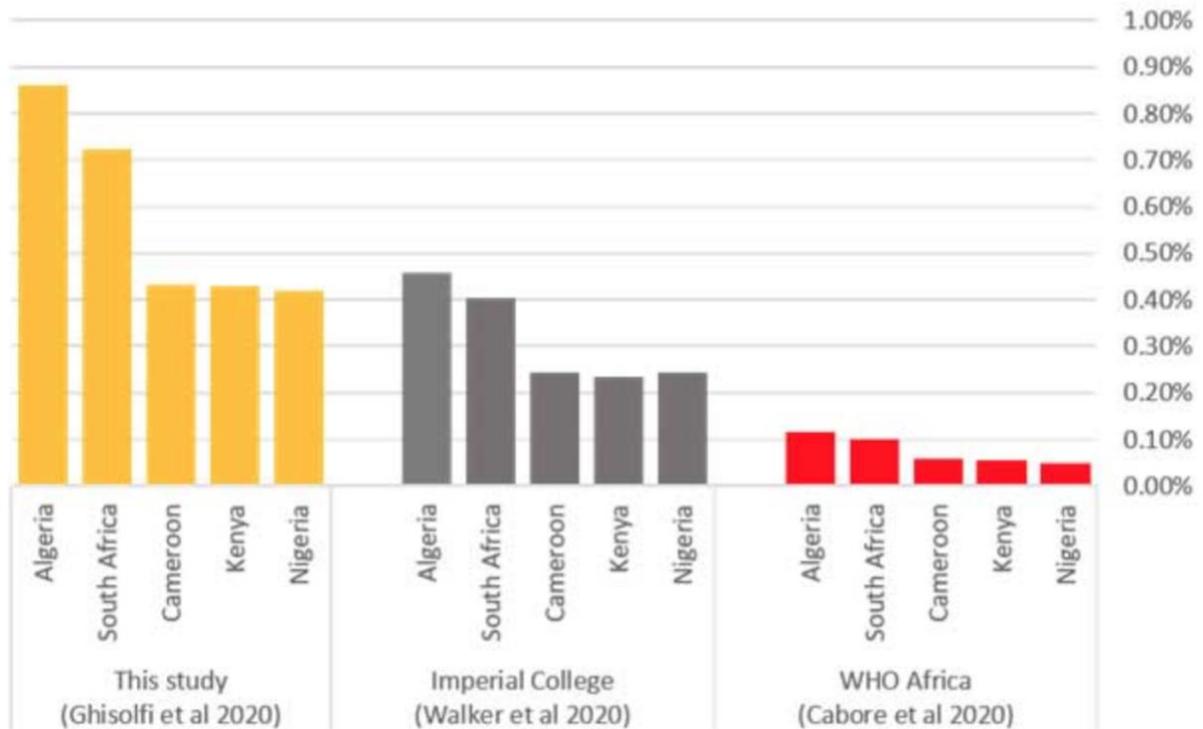
### **Predicting COVID-19 infection fatality rates around the world – June 16, 2020’**

<http://www.ipsnews.net/2020/06/predicting-covid-19-infection-fatality-rates-around-world/>

- The epicenter of the pandemic is moving from advanced economies to more developing countries including Brazil, India, and South Africa
- Data from Italy show that roughly 96% of COVID-19 fatalities report 1 ore more relevant comorbidities
- The probability of dying from a COVID)19 infection for patients under 40 is roughly 134 times higher with a relevant comorbidity than without
- Some developing countries such as South Africa report a considerably higher share of these conditions among middle-aged people
- If fatality rates in developing countries are gauged by drawing a comparison to the infection fatality rate for another viral respiratory infection such as influenza, as well as focus on children under the age of 5 to purge variations in age and comorbidities

that typically begin later in life, this year a COVID-19 infection fatality rate that is considerably higher than previous estimates for the developing world

### Selected African Countries



- Unlike in the US, the demography and weak health system leads to COVID-19 deaths that are more concentrated among younger people in the developing world
- The bulk of deaths in low-and low-middle income countries is predicted to come from middle-aged patients (40-70)
- When high-quality intensive care is lacking, the advantages of youth are more muted
- In Europe data shows that intensive care saves the lives of a higher proportion of young than elderly COVID-19 patients

### Coronavirus-Infected Cells Grow Filopodia – June 30, 2020

<https://www.the-scientist.com/news-opinion/coronavirus-infected-cells-grow-filopodia-67679>

- A study found that when SARS-CoV-2 infect cultured monkey cells, its co-opts numerous host proteins
  - o This changes their function through chemical tags known as phosphate groups
- A cell protein called CK2 spurs the growth of tentacle-like protrusions known as filopodia
  - o These filopodia contain viral particles and are likely used to pole holes in nearby cells, spreading SRAS-CoV-2 to them
  - o This may explain rapid viral spread throughout the body



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- 40 of the 332 human proteins that interact with SARS-CoV-2 were significantly differentially phosphorylated in cells infected with SARS-CoV-2
- They also identified 49 human kinases out of a total of 518, that showed changes (either upregulation or downregulation) of phosphorylation activity
- The most strongly hijacked kinases include casein kinase II (CK2), kinases within the p38/MAP kinase (p38/MAPK) pathway, cyclin-dependent kinases (CDKs) and phosphatidylinositol 5-kinase (PIKFYVE), all of which fall within a set of cell signaling pathways
  - o Because kinases possess certain structural features, they are very druggable targets with more than 500 compounds commercially available or in development
- CK2, a kinase that plays a key role in cytoskeleton formation, cell growth and proliferation as well as apoptosis (cell death), physically interacted with the SARS-CoV-2 viral N protein and was significantly more activated in virally infected cells.
  - o Using a CK2 inhibitor in the laboratory experiments eliminated the virus.
- Cells infected with SARS-CoV-2 have significantly reduced CDK activities, which may facilitate viral replication. I
  - o Inhibition of CDKs may halt viral replication.
- PIKFYVE, a FYVE finger-containing phosphoinositide kinase that regulates cytoskeleton function, is targeted in a variety of different cancers. The compound apilimod that targets this kinase potently inhibited SARS-CoV-2 in the laboratory setting
- Based on an initial systematic review of these compounds, the researchers identified seven agents, primarily anti-cancer and anti-inflammatory compounds, that demonstrated antiviral activity in laboratory experiments: silmitasertib, gilteritinib, MAPK13-IN-1, SB203580, ralimetinib, apilimod and dinaciclib.
- Interestingly, while studying the impact of SARS-CoV-2 on CK2, high resolution imaging of virally infected cells revealed actin-rich filopodia containing viral proteins
  - o Human CK2 and the viral N protein were found co-localized within the filopodia, suggesting that SARS-CoV-2 hijacks CK2 and co-opts it into creating these tentacle-like protrusions that poke holes in their neighboring cells
- In SARS-CoV-2 infected cells, the filopodia exhibit longer tentacles and branches, enabling more aggressive transmission than some other viral infections.