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Send your kids back to an actual school?

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A normal-ish life before there's a vaccine?

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The Way Ahead

Inside a Covid-19 Vaccine Factory

How businesses are responding
to the pandemic

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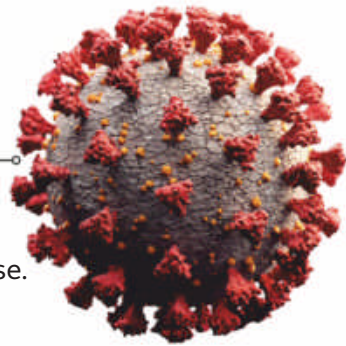
The vaccine factory

Eight years ago, Emergent began planning for a crisis like Covid-19. With the federal government's help, the company built a vaccine manufacturing facility in Baltimore.



Just in case

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Operation warp speed



Staring down the threat

If the vaccines are approved by the FDA, they'll probably be available to patients by early next year. "Our commitment to our fellow Americans is: We're not going to fail," says CEO Robert Kramer.



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Michael Brock
Managing Director
Wells Fargo Corporate & Investment Banking



Delivering Services Innovations to Drive Post-Pandemic Growth

By Li Fangfang

At the entrance of the China International Fair for Trade in Services (CIFTIS) exhibition hall in Beijing, machines powered by artificial intelligence (AI) measured visitors' temperature. Guide robots took them wherever they wanted to go, and robotic servants made fancy coffee. These remarkable

assistants were the superstars at the fair not only because of their sci-fi concept but also because of the real services they offered.

Beyond robots, advanced technology ensured the smooth integration of online and offline events to bring CIFTIS to audiences worldwide. More than 20,000

companies and organizations, and 190,000 people from 148 countries and regions registered for the fair with exhibitors from abroad mainly participating through cloud services.

The fair was fully digitalized due to the COVID-19 pandemic. Even after the offline fair ended on September 9, the online version will remain open for a whole year.

To support intensive live-streaming conferences for the six days of the offline fair, plus nearly 7,000 virtual exhibition demonstrations and online chatrooms for private negotiations, JD Cloud & AI, the technological arm of e-commerce giant JD.com, created a comprehensive digital platform.

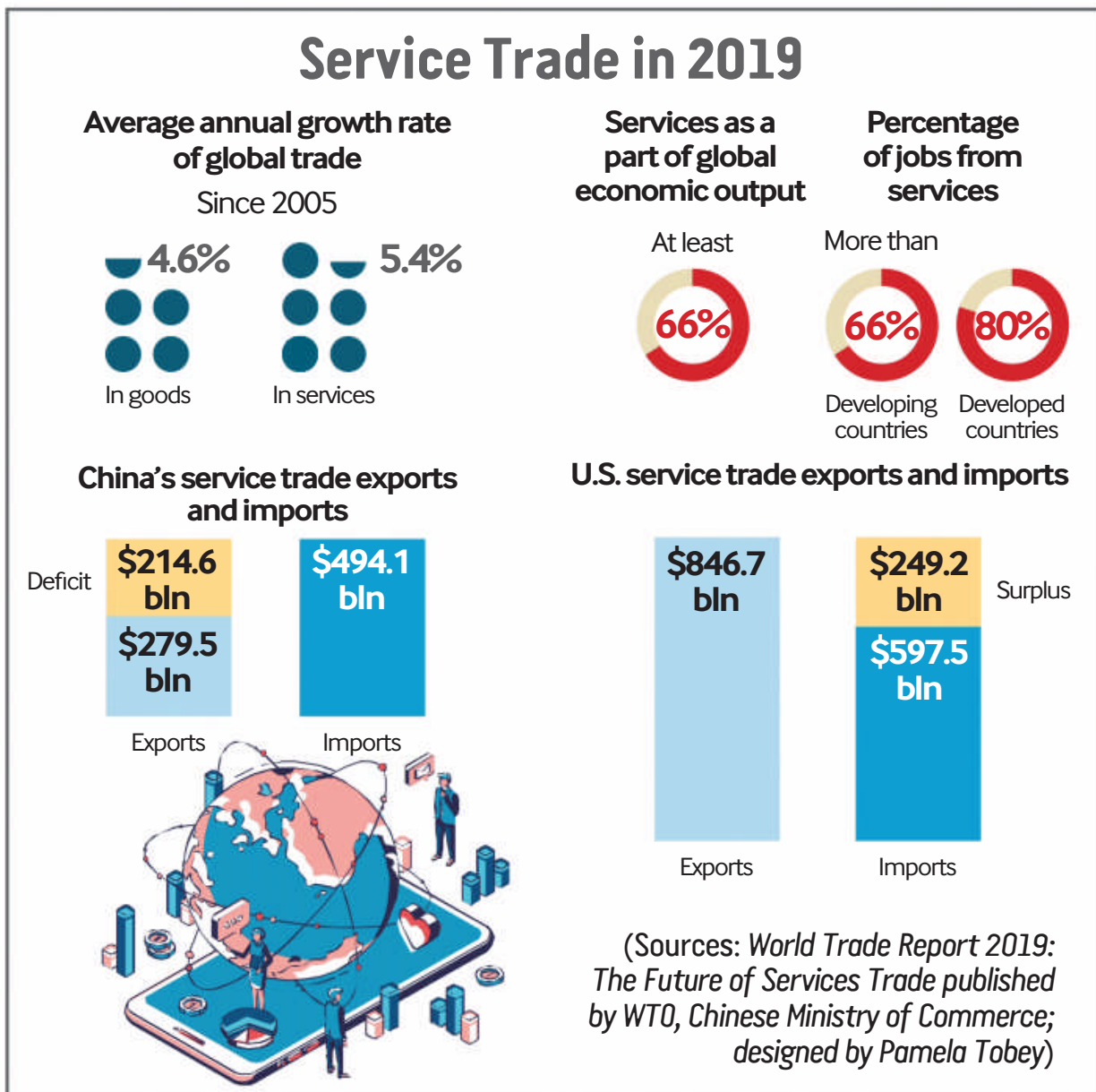
"Exhibition, forums and business negotiations were the three main scenarios where we digitized the fair," JD.com's Vice President Wang Peinuan said. AI, big data, cloud computing and the Internet of Things were used to create the platform.

Sci-fi touch

Security was a prime consideration. In the chatrooms, the exhibitors could set the duration for their message to show. When it ended, the messages were automatically deleted. If anyone took screenshots of messages, they could be tracked.

An important element of CIFTIS was the demonstration of extensive industrial application of hi-tech services. The mini logistics center at the fair was another sci-fi-meets-real-world scenario. At the center, mechanical arms sorted items with the help of cameras, while robotic vehicles transported them to different destinations, guided by QR codes.

The logistics center was the brainchild of Megvii, a company providing AI solutions





A traditional Chinese medicine robot checks a visitor's pulse at the China International Fair for Trade in Services in Beijing on September 7

and products. After social distancing measures were implemented worldwide following COVID-19, robots have become a welcome business.

"We helped a world-leading fashion company build an automatic logistics center in Shanghai in April," Cheng Changshun, Vice President of Megvii, said. The Shanghai logistics center will have 800 smart vehicles.

In his eyes, China still lags in automatic manufacturing and logistics, and Megvii's products will help improve industrial digitization in the country. It is not the first smart logistics center in the world, but its relatively low costs can be a significant competitive edge.

The fashion company is known for its exacting requirements. "That's why we want to cooperate with them," Cheng said. Megvii also has overseas clients such as those from Singapore and Thailand.

"We help clients from overseas lower production cost and realize automation and digitization of logistics," Cheng said.

Megvii was also the main supplier of the AI temperature check equipment for the fair. Portable with a small camera on a tripod, the machine can run a maximum of 15 checks per second.

Dry-mist robots from another Chinese company, Iben Robot, are serving hospitals in Wuhan in the central province of Hubei, Shanghai and Beijing, where frequent sanitizing is needed.

With safety of medical workers one of the main concerns during the pandemic, the domestically developed robot is a nifty tool that can issue a super dry mist of disinfectant to disinfect areas at high speed. The robots have automatic navigation, can disinfect the target place 360 degrees and

can be activated by iPad control.

Iben Robot's sales manager Liu Yunfei told *Beijing Review* that it took them three weeks to get the machines ready for use in February.

E-commerce achievements

During COVID-19, one sector that has maintained rapid development is e-commerce. Li Mingtao, an e-commerce expert with China International E-commerce Center affiliated to the Ministry of Commerce, drew attention to the delivery of medical supplies around the world through cross-border e-commerce. "It played a key role in the global anti-COVID-19 effort," Liu said at the CIFTIS Cross-Border E-Commerce Forum on September 6.

Amazon and eBay both saw massive sales increases in the first half of this year. The Alibaba Group's revenue grew 34% year on year in the second quarter.

"We mobilized our entire digital infrastructure to support the recovery of businesses across a wide range of sectors, while broadening and diversifying our consumer base by addressing their changing preferences in a post-COVID-19 environment," Daniel Zhang, Chairman and CEO of Alibaba, said.

"Taobao.com (Alibaba's consumer-to-consumer platform) grew rapidly in 2003 when the severe acute respiratory syndrome broke out, as well as other Chinese e-commerce companies including JD.com," said Sun Jianwei, Chairman of the Micang Supply Chain Group, a Shenzhen-based freight forwarder. "The COVID-19 pandemic is changing people's consuming habits, which will boost the development of e-commerce."

However, cross-border e-commerce faces some uncertainties due to some politically driven restrictions, Sun said.

"We should promote consistency of legal frameworks and policies among countries to form consensus to beef up market confidence," Chai Yueting, a professor at Tsinghua University, said at the e-commerce forum.

Chai mentioned the significance of digital logistics platforms. "The epidemic has little adverse impact on e-commerce, especially cross-border e-commerce, to a large extent because our logistics are not disrupted," he said.

For greater cross-border e-commerce, he advocated reducing logistics costs and improving efficiency. Also, many logistics platforms are still regional and have not yet achieved global interconnection. They need to buck up.

The service industry has become an important pillar of the world economy. Two-thirds of the employment in developing countries and four-fifths in developed countries come from services.

Last year, China became the world's second-largest importer of services. In the first half of 2020, the added value of China's service industry accounted for 56.5% of GDP.

Unlike the trade surplus in goods, China faced a deficit in the trade in services for years. However, changes have begun to take place since 2019, according to Liu Chunsheng, a professor at the Central University of Finance and Economics in Beijing.

Liu said the total import and export volume in 2019 increased 2.8% year on year, while the deficit decreased 10.5%. The exports of financial and insurance services increased steadily.

In 2020, the growth of knowledge-intensive service trade, as represented by computer information services, has given new impetus to global economic recovery, Vice Minister of Commerce Wang Bingnan said on September 5.

Next, China will move faster to open up the healthcare, culture, education and telecommunications sectors, and introduce a negative list of off-limits items for cross-border trade in services, he added. ■



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◀ Rorick Fuller, from the Houston Covid Task Force, investigates a safety complaint

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In Germany they actually listen to their Covid expert

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■ COVER TRAIL

How the cover gets made

1

“So this week we’re talking about testing!”

“Have I ever told you I’m really over the pandemic?”

“I know... I know. But if we had reliable rapid testing, we might enjoy the semblance of normalcy—”

“Say no more. I think I have the perfect metaphor for how we’ve been handling it.”

2



“Ouch! But kind of off the mark, I think? It’s so much bigger than this.”

“Ooooooh. You mean, like, sports stadiums?”

“No, I mean, like, human lives.”

“Maybe something more straightforward, then?”

“Yes, please. Because we really, really need those tests.”



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● The coronavirus crisis reached a grim milestone, with deaths surpassing

1m

worldwide. The chief epidemiologist of China, where the pathogen originated at the end of 2019, warned that the global pandemic is unlikely to be contained in the near future. ▷ 50

● Armenian and Azerbaijani forces clashed over the disputed territory of Nagorno-Karabakh.

The conflict risks drawing in nearby Russia and Turkey, whose president, Recep Tayyip Erdogan, is an ally of Azerbaijan. Vladimir Putin, eager to restore order on Russia's southern flank, urged both sides to cease combat and resume talks.



An Azerbaijani soldier is buried on Sept. 29. Nagorno-Karabakh, largely populated by Armenians, declared independence from Azerbaijan in 1991. Both sides accuse each other of targeting civilian areas in the recent fighting.

● Nippon Telegraph & Telephone plans to turn its mobile unit, NTT Docomo, into a wholly owned subsidiary, in a buyout valued at about

\$40b

The tender offer ranks as the largest in history for a Japanese company.

● Donald Trump paid just

\$750

in income tax in 2016, the year he became president, an investigation by the *New York Times* found. Trump disputes the findings, though so far he hasn't made his tax returns public, saying he's still being audited.

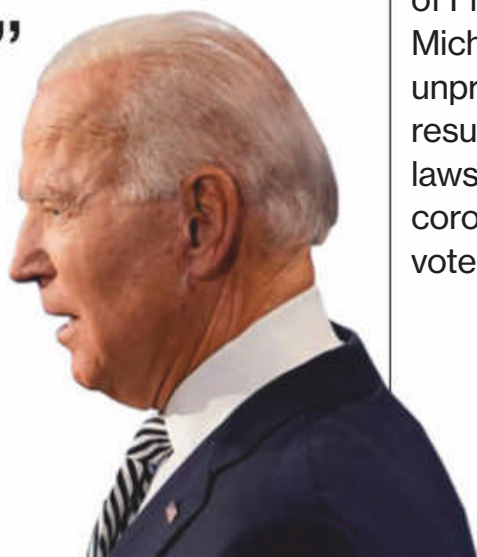
● Devon Energy agreed to acquire WPX Energy in a \$2.56 billion all-stock deal.

The combination creates one of the largest independent producers of U.S. shale, an industry hit hard by oversupply, bankruptcies, and collapsing prices.

● Companies are cutting thousands of jobs worldwide, in a sign that a recovery remains distant.

Disney will eliminate 28,000 positions at its theme parks, cruise lines, and retail operations. German auto parts supplier Continental firmed up a plan to get rid of or shift 30,000 jobs globally. Royal Dutch Shell will let as many as 9,000 workers go as it scales back refining and other operations.

● “It’s hard to get any word in with this clown. Excuse me, this person.”



Joe Biden was confronted with a combative Donald Trump at their first debate. The encounter descended immediately into acrimony, with moderator Chris Wallace frequently admonishing the president to stop interrupting the former vice president.

● More than 1 million people have cast ballots for the U.S. presidential election using the mail and early voting locations, according to data compiled by University of Florida professor Michael McDonald. The unprecedented surge is the result of changes in state laws, concern about the coronavirus, and intense voter interest. ▷ 43

● Kuwait’s ruler, Sheikh Sabah Al-Ahmed Al-Jaber Al-Saba, died at 91. Sheikh Sabah sought to mediate intra-Arab disputes, while maintaining strong ties with the U.S. and rebuilding relations with Iraq after the fall of President Saddam Hussein.



Only a New President Can Undo Trump's Damage to the CDC

Inch by inch, since the start of the pandemic, the White House has sought to sabotage the Centers for Disease Control and Prevention for the political benefit of President Trump. To an alarming extent, it has succeeded. Once globally recognized as “the best science-based, data-driven agency in the world,” in the words of its current director, the CDC is now in danger of losing the public’s trust entirely.

The most glaring problem has been communication. Against the best judgment of its own staffers, the agency has said reopening schools is crucial even if doing so increases the spread of the coronavirus. It’s failed to caution churches to suspend or limit the use of choirs, which have been associated with outbreaks. It’s even discouraged testing asymptomatic people, contrary to the advice of almost all experts—though it eventually reversed itself under a barrage of criticism. In each case the agency’s scientific staff was ignored or overruled under pressure from the White House or from Trump himself.

At every step, the administration has made matters worse. Its political operatives have pushed the CDC to revise Covid-19 analyses in its respected *Morbidity and Mortality Weekly Report* and bullied agency officials. In an email obtained by the *New York Times*, a Department of Health and Human Services adviser accused Dr. Anne Schuchat, an esteemed deputy director, of working to “embarrass the president.” Trump publicly criticized CDC Director Robert Redfield for emphasizing to Congress the importance of wearing masks and acknowledging the reality that vaccines are unlikely to be widely available until next year.

While Redfield has failed to forcefully push back on these attacks, he’s not principally to blame for the CDC’s fall from grace. That responsibility rests with Trump, who’s showing how much harm a president can cause by forcing federal agencies to serve his political purposes. Rather than allow the CDC to do its job of keeping Americans informed about Covid-19, he’s prodded the agency to echo his false message that the crisis has passed, that it’s safe to go back to school, to work, to church, to political rallies—maskless and carefree.

Clearly, new leadership is needed, mainly at the White House. If voters can get that job done in November, the good news is that it’s still possible to return the CDC to its former effectiveness. With a new director working for a president who’s sensible enough not to meddle inappropriately, the agency could gather detailed data on Covid-19 from the states, maintain an up-to-date national dashboard on the outbreak, and allow its scientists to resume regular public briefings, thereby once again offering Americans a common and reliable source of information about the pandemic.

Congress can help, too, in part by investigating why the CDC produced a faulty coronavirus test at the start of the pandemic. It should also pass legislation to protect the agency’s data-gathering efforts from outside interference—to avoid the kind of chaos that occurred last summer when HHS officials abruptly took over the collection of hospital data on Covid-19 (another move that had to be reversed). Finally, lawmakers should ensure that the CDC’s technical reports are insulated from political meddling, much as reports from the Labor Department, the Census Bureau, and the National Center for Health Statistics are.

Quite by accident, the Trump administration has taught the country a lesson about how much it needs an effective CDC. Ideally, the agency can be brought back to full strength in time to finally offer some federal leadership in a crisis that’s been out of control for too long. **B** For more commentary, go to [bloomberg.com/opinion](https://www.bloomberg.com/opinion)

■ AGENDA



► Give Peace a Chance

The Nobel Peace Prize is announced on Oct. 9. The favorites among the more than 300 nominees are climate activist Greta Thunberg, New Zealand Prime Minister Jacinda Ardern, and the World Health Organization.

► Australia unveils its annual budget on Oct. 6. The economy has suffered and unemployment has jumped as people have lost their jobs in the pandemic.

► The vice presidential debate on Oct. 7 pits incumbent Mike Pence against Kamala Harris, a week after their bosses faced off in the first of their three encounters.

► Tajikistan holds a presidential election on Oct. 11. Emomali Rahmon, who’s ruled the former Soviet republic since 1992, is running for his fifth term in office.

► European Union energy ministers meet in Berlin on Oct. 5-6. Topics will include energy and climate targets set for 2030 and the bloc’s hydrogen strategy.

► Germany’s powerful BDI industry lobby holds a technology summit on Oct. 5-6. Chancellor Angela Merkel and Airbus CEO Guillaume Faury will be among the speakers.

► The National Association for Business Economics has its annual meeting on Oct. 5-7. Speakers will include Federal Reserve Chair Jerome Powell.



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REMARKS



**Welcome to
Moldova, USA**

● Election monitors who watch global hot spots worry about “democratic backsliding” in the U.S.

● By Marc Champion

Ahead of November’s presidential election, an assessment by the Organization for Security and Cooperation in Europe (OSCE) explained its decision to send a “large” team of observers to help ensure a clean vote: There were fears the incumbent might abuse government resources to keep power; disinformation (or “fake news”) was being spread; and inflammatory language was being used. The report, published in September, was about the former Soviet republic of Moldova, where voters will choose a new leader on Nov. 1. If you thought it was describing the U.S., which goes to the polls two days later, that’s an easy mistake to make.

For decades, American nonprofits such as the National Democratic Institute, the International Republican Institute, and the Carter Center have observed elections in Moldova and other nations around the globe, confident of the model their own country, the world’s oldest constitutional democracy, had to offer. But this year’s contest between President Trump and former Vice President Joe Biden is holding up a mirror. Fought amid the Covid pandemic, Black Lives Matter protests, and a level of political polarization not seen for a century, it’s looking a lot more like the ones these organizations so often criticize—with even such fundamentals as the willingness to lose in doubt.

“What country are we in?” Biden asked on Sept. 24 after Trump declined at a press conference to commit himself to a peaceful transfer of power as long as people are allowed to vote with mail-in ballots. The president refused again to give a blanket pledge to honor the election result when the two men met for their first debate a few days later. The chaotic, vituperative TV spectacle left many watching from outside the U.S. aghast. The German newspaper *Die Welt* called it a “manifestation of how far America has fallen in the Trump era.” The *Sydney Morning Herald* said it painted a vivid portrait “of a democracy and global superpower in deep trouble, and possibly long-term decline.” China’s semiofficial *Global Times* could only gloat at what it said showed a superpower grown unattractive and “in recession.”

One direct answer to Biden’s question came from Mitt Romney, himself a former Republican presidential candidate: Without a peaceful transition of power, “there is Belarus,” he tweeted. That post-Soviet nation, ruled by one man, President Alexander Lukashenko, for the past 26 years, has been in turmoil since his Aug. 9 reelection was widely dismissed as stolen.

From allegations of voter suppression and abuse of the Postal Service for political ends to a candidate warning of

large-scale ballot fraud before the first polling station has even opened, no previous U.S. vote has looked so depressingly familiar to veterans of international election monitoring. And with the Sept. 18 death of Supreme Court Justice Ruth Bader Ginsburg, that list of commonalities got longer still. The brutally partisan dispute over her precipitous replacement has thrown yet another fundamental strength of U.S. democracy—an independent judiciary—into the 2020 cauldron.

“The number of possible things that could go wrong this time is higher than I have seen in my lifetime,” says Sarah Repucci, head of research and analysis at Freedom House, which annually ranks countries around the world on a range of democratic freedoms, including elections. “Traditionally, our electoral process scores for the U.S. were perfect.”

That’s unlikely to be the case when the organization makes its next index. The Carter Center, a nonprofit that’s monitored 110 elections in 39 countries abroad since 1989, said on Aug. 28 that it was assigning a team to work at home “to help build confidence in the process and results.” The unprecedented decision marks the first time the organization has detected democratic “backsliding” in the U.S. The OSCE, a 57-nation body of which America is a leading member, had planned to send 400 observers for Election Day plus a 100-strong long-term election monitoring team, with the latter recommendation up from 26 in 2016. But staff are supplied by the member states, and a combination of Covid safety concerns and travel restrictions have led to a shortfall, according to spokesperson Katya Andrusz. The mission will be scaled back to 14 core experts and 30 long-term observers.

To be sure, U.S. democracy has long suffered from serious failings, including opaque campaign finance, gerrymandering of electoral districts, and the disenfranchisement of the world’s largest—and disproportionately Black—prison population. A democracy index run by the Economist Intelligence Unit, the U.K.-based research arm of the *Economist*, has ranked the U.S. among “flawed” democracies since 2016, trailing most of Western Europe.

The probity of the election process itself, however, remained a U.S. strong suit, even after the 2000 “hanging chad” episode, when Ginsburg and the eight other members of the Supreme Court had to rule on whether to allow a recount in Florida. Democratic candidate Al Gore accepted the court’s decision against him, despite having beaten George W. Bush in the popular vote. His willingness to submit to the rules of the game is a distinguishing factor of a healthy democracy. It’s hard to imagine a repeat in the toxic political mood of 2020, in particular if mail-in votes should tip the result against Trump.

Equally familiar to international election observers are allegations of voter suppression, such as culling the number of polling stations in targeted areas or imposing onerous voter ID requirements to reduce turnout in minority, primarily Black, districts. On Sept. 24 the actor and former Republican governor of California Arnold Schwarzenegger ►

◀ said he would fund the reopening of Southern polling stations closed since the termination in 2013 of the 1965 Voting Rights Act, which had protected against moves to disenfranchise Black voters.

Nations in which voter suppression targets minorities form the kind of club you shouldn't want to join. Zimbabwe's ruling ZANU-PF party was long accused of using intimidation and registration hurdles to reduce the vote of the country's minority Ndebele community, which tends to vote for the opposition. In Turkey, ethnic Kurds accused the authorities of suppressing their vote in 2018 parliamentary elections by closing polling stations on bogus security grounds. In Moldova, the opposition fears that on Nov. 1 the government will open a higher density of polling stations for its citizens living in Russia, where the nation's migrant workers tend to back the pro-Russia incumbent Igor Dodon, than for those in the European Union.

Allegations that Trump's postmaster general, Louis DeJoy, has cut funding and dismantled sorting machinery for political ends since his appointment in June recall frequent examples of institutional abuse for political ends in other countries. DeJoy has said he's trimming costs for business reasons. Democrats say he's deliberately undermining the system's capacity to process mail-in ballots, which are used more by Democratic than Republican voters. Mail-in voting is rare in emerging economies, so this would be a new twist. But governments determined to stay in power have long used control over other institutions to skew elections, including politicized courts, stacked electoral commissions, weaponized law enforcement, and state-run media that can smear opposition candidates.

The U.S. is still a world apart from Moldova, let alone the Potemkin democracies of Belarus or—despite President Vladimir Putin's claims of his country's democratic superiority—Russia, where free media is muzzled and opposition politicians have been jailed, deported, and even poisoned. “Of course, the situation has changed recently in the U.S., but you cannot compare it,” says Janez Lenarcic, who headed the OSCE's election monitoring operations when it observed the 2008 and 2012 U.S. presidential contests, as well as votes in many of the former Soviet republics. “In the U.S., you have qualified, effective, efficient electoral administration bodies, you have freedom of the media, freedom of expression—you have vibrant processes and strong traditions based on individual liberties and freedoms,” he says, adding that he was speaking in a private capacity and not in his current role as the EU commissioner for crisis management.

Some of the apparent similarities with weak electoral systems may even speak to the underlying strength of U.S. democracy. Take Trump's pre-vote warnings of fraud. Prior claims of fraud are common in countries with few or weak democratic institutions. Yet, in those places, it's invariably the opposition that makes such claims, based on the experience—often well documented by international observers—of past elections a ruling party has stolen. Numerous

studies have shown that the U.S. has no modern record of statistically significant voter fraud, whether by mail or at the ballot box.

The same goes for the controversy over voter ID laws—something election observers routinely try to get autocratic governments to adopt. That makes sense in a country such as Zimbabwe, where the inevitable reduction in turnout that such requirements produce is a price worth paying to reduce ballot box stuffing. Less so in the U.S. In 2016, three courts—in North Carolina, Texas, and Wisconsin—overturned voter ID requirements introduced to combat alleged fraud, largely because the states' attorneys had failed to provide evidence of such a threat. In Wisconsin, the judge complained they hadn't produced a single instance of a voter who'd been charged with the crime.

Adding citizen observers at polling stations is again something international observers tend to encourage, because it can add transparency to distrusted systems. But Trump's opponents fear that his call for an additional 50,000 Republican Party observers to monitor polling stations on Nov. 3—as with his claims of widespread mail-in ballot fraud—may be an attempt to do the opposite: sow doubt in a fundamentally trustworthy system.

What worries historian Edward Foley is that the mechanics of U.S. democracy haven't always been as trusted or clean as they were for much of the 20th century, and there's no guarantee they won't regress. American elections in the 18th and 19th centuries were as rife with instances of blatant fraud, voter intimidation, and violence as those in many emerging democracies today. Foley's 2016 book *Ballot Battles* chronicles a litany of bare-knuckled power grabs and frauds, including the use of troops to intimidate voters, bogus ballot exclusions, and an 1855 vote in Kansas on whether to declare itself a free or slave state that saw 6,307 ballots cast—out of 2,905 eligible residents.

Perhaps most worrying today is the precedent of the 1876 Hayes vs. Tilden presidential election, in which Democrats—then largely the party of the South—suppressed the Black vote, and Republicans used their control of critical state election bodies to steal votes back. When both candidates claimed victory, Congress, the final arbiter of such disputes, split on party lines. The deadlock was broken only when Hayes agreed to withdraw federal troops from the South, effectively ending Reconstruction in exchange for the presidency. The Achilles' heel of the U.S., Foley says, remains the arbitrating role that partisan institutions play in election disputes.

Still, Alexander Hamilton, a co-author of the Constitution, once said that the true test of a democracy is not when the result is so tight it's disputed, but when a candidate rejects a result that is, at least according to the accepted norms, clear. “What would worry Hamilton is if there was an outcome this year that was not close in the 2000 Bush vs. Gore sense,” Foley says. “If there were no hanging chads or real reason to dispute the result—and it's just that the losing side didn't like losing.” **B**

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Macau Is Still Rolling Snake Eyes

● Despite China's rebound, its gambling capital is in a slump even Golden Week can't break

In a normal year, right about now would be the start of a tourism tsunami across China. And after five months of near-zero revenue, Macau's pandemic-weary casinos were hoping that a rush of travelers during China's Golden Week would provide a fast rebound. Starting Oct. 1, the anniversary of the founding of the People's Republic, the holiday—it actually lasts eight days this year—usually sees the world's biggest gambling hub hit more than twice its normal population as mainland punters stream in.

But even though Beijing finally started handing out visas and easing travel restrictions over the past two months, Macau has seen only a trickle of arrivals, and its gaming floors remain largely empty. The most optimistic predictions now are that Golden Week will deliver half of last year's almost 1 million tourists—a big disappointment for a local economy that contracted 68% in the second quarter.

“Everyone's expectation is to do a percentage of the past year's [revenue]. No one is expecting to have an immediate rebound,” says Linda Chen,

vice chairman of Wynn Macau Ltd., affirming industry estimates that this year's Golden Week will log only 30% to 50% of last year's gaming revenue, which gaming consultancy IGamiX pegged at about \$1 billion. “We need to do it step by step. To have a successful, issue-free Golden Week period will turn around the whole perception of travel to Macau.”

Those figures are all the more underwhelming given that the Las Vegas Strip, which brings in only a fifth of Macau's returns, saw gaming revenue hit 60% of last year's level in July after casinos gradually reopened in June. And in Cambodia, an up-and-coming destination for Asian gamblers, NagaCorp Ltd.'s gaming revenue jumped to more than 90% of pre-Covid levels in August after its casino complex reopened in early July.

In contrast, September revenue in Macau will be only about 11% to 14% of last year's, according to Ben Lee, a Macau-based managing partner at IGamiX. That tepid performance comes despite visas having been available to residents in China's Guangdong province—which previously accounted for a third of Macau's visitors—since late August.

The outlook has deepened concerns over the future of the gambling enclave, which was in a slump even before the pandemic thanks to growing

regional competition, China's slowing economy, and street protests in neighboring Hong Kong. "Macau has seen a more gradual recovery because its 'local' clients are in fact on the other side of a border," says China International Capital Corp. gaming analyst Shengyong Goh. "The pandemic has exposed a chronic problem of Macau: its economy being over-dependent on tourism and gaming."

Travel agents say that interest in visiting Macau has been weak because of inconvenient new requirements for those crossing the border between it and mainland China, such as a negative virus test. Any resurgence of coronavirus infections could also lead to abrupt new border controls imposed by China, and holiday makers don't want to run the risk of being stranded in Macau. Meanwhile, vacation destinations on the Chinese mainland, such as the southern province of Hainan, are proving an alternate draw with such perks as duty-free shopping. Only five of 23 Macau hotels surveyed by Morgan Stanley were fully booked for the Golden Week holiday as of mid-September, down from 19 a year earlier.

On Chinese travel portal Qunar.com, the average booking price of Macau hotel rooms for this year's holiday week was down 40% from 2019. "We won't expect much tourist traffic to Macau for the rest of the year," says Versiglia Chong, a sales director at Macau-based VT Travel Agency Co.

Still, some retailers who count on tourists to the gambling hub remain hopeful. "The entire industry was so quiet for the past nine months that in the next three months, the stakes are very high," says Vincenzo Carrieri, Asia Pacific regional director of Italian luxury menswear brand Canali. The brand hasn't seen any substantial increase in traffic at its two Macau outlets since the China border reopened, but it hopes business will return to 70% of pre-Covid levels by yearend. "Both casinos and brands are preparing big marketing plans and putting resources in in order to get more customers back," he says.

Macau's tourism office has stepped up its promotional offers across the border. To entice mainland tourists, it's issuing 290 million patacas (\$36.3 million) in consumer vouchers through weekly lotteries it's holding on WeChat, Tencent Holdings Ltd.'s messaging app, from September to December.

Macau is facing other choke points on its life-line of Chinese customers. Half its revenue usually comes from high rollers known as VIPs, who bet big through credit provided by middlemen known as junket operators. Some of these junket outfits also promote gambling trips and online games for affluent Chinese in locations such as the Philippines and Cambodia. Beijing has cracked down on the activity in the past year, calling it a "profound financial risk,"

as it involves cross-border currency movements.

In recent months the government has frozen bank accounts and arrested tens of thousands of people involved in cross-border gaming—including participants in online games held in those locations through which Chinese gamblers take part via video links. This has spooked high rollers, who have held off on gambling in Macau as well, even though wagering there is legal, say analysts. That, in turn, will slow the enclave's recovery, says IGamiX's Lee. "Junket liquidity, which traditionally financed high-level play, is at an unprecedented low," he says.

Pacific Intermediary Co., a junket operator that focuses on Chinese VIP gamblers, is starting to feel the pain. "Even people who wish to come to just have fun are adopting a wait-and-see strategy, and all the cash-lending activities have to be tightened," says founder U. Io Hung.

To overcome current challenges, operators are reviving long-discussed plans to promote Macau as more than just a haven for baccarat and blackjack. Although casinos have tried to use stage shows, theme parks, and shopping arcades to draw mass-market tourists in the past decade, the enclave's economy still relies overwhelmingly on the gambling tables.

"We would love to have more nongaming revenue by creating better attractions, food and beverage, and retail offerings," says Wynn Macau's Chen. "There's a lot of different aspects of someone's trip besides just the casino. That's why in our next phase of development, we are really focused on nongaming." —*Jinshan Hong, with Daniela Wei*

THE BOTTOM LINE Macau, the only place where gambling is legal in China, usually sees almost 1 million tourists during the Golden Week holiday. This year the gaming hub may get half that number.

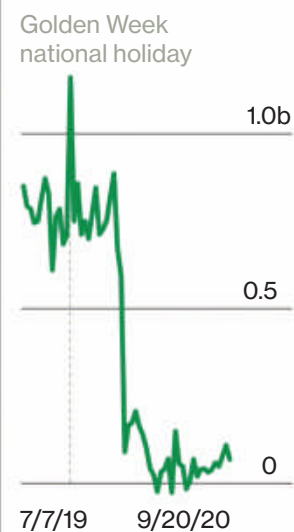
How Nerds Take Their Coffee

● Single-serve giant Keurig is betting there's a market for a Wi-Fi-enabled machine

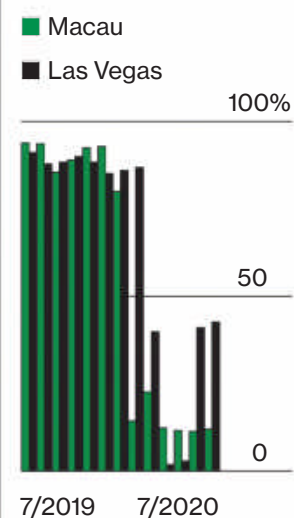
Since their debut in the late 1990s, Keurig coffee machines have built a mass following for their sturdy dependability. The functionality and design—think the no-frills cousin to Nestlé SA's sleeker Nespresso range—speak to an era when coffee was chiefly thought of as a utility to rouse the sleepy. ▶

◀ Macau's Casino Lisboa

▼ Macau daily gross gaming revenue in Macanese patacas, average for the trailing week



▼ Hotel occupancy rate



◀ These days, as more Americans come to revere a cup of coffee as something of an art form, Keurig Dr Pepper Inc. believes drinkers will pay a premium for an appliance that promises to perfect java down to its most minute details. Enter the Keurig Custom Smart, a \$399 Wi-Fi-enabled capsule brewer seeking to gauge the U.S. thirst for connected caffeine when it begins selling in late October.

Set to be the company's most expensive machine, the Custom Smart has software that can recognize every one of the more than 800 pod varieties Keurig manufactures, including those under license from the likes of Starbucks Inc. and Dunkin' Brands Group Inc. It will then brew the contents of the pod to exact specifications: It knows, to the degree, what temperature the water should automatically be warmed or cooled to and the pace at which it then trickles through the grind and into the cup. Should a tech-forward gourmet believe she knows better than the master roaster, she can still remotely fine-tune thousands of permutations related to heat, speed, and strength through a mobile app.

"This is the future of coffee," says Chief Executive Officer Bob Gamgort. "Keurig created the single-serve coffee category in the U.S., and now we're paving the way for a connected and personalized brewing experience at home."

For casual coffee drinkers perfectly content with unpretentious coffee, the pomp associated with such contraptions may well be a turnoff. But for Keurig Dr Pepper it represents a culmination of an image upgrade, from manufacturer of frumpy brewers to purveyor of connected household staples for the modern, latte-sipping aesthete. The strategy taps into the increased sophistication of consumers eager to set themselves apart from the faceless masses by choosing niche craft beer, slow-roast beans, and small-batch spirits, produced ethically and with an uplifting corporate story to tell.

The caffeine industry is undergoing profound change, with drinkers becoming more knowledgeable about the roasts they purchase and more committed to extracting the best possible pour. Global behemoths such as Nestlé have taken note. The Swiss food and beverage company bought Blue Bottle Coffee and Chameleon Cold-Brew in 2017 to push into premium java, and it's elevated its Nespresso range into a consumer experience akin to shopping at a tony designer boutique.

The new Keurig, which costs about four times as much as a standard load-press-drink pod machine, is set to challenge Nestlé's Vertuo line of big-cup coffee machines in the U.S. Nestlé introduced

that device a few years ago after finding that few Americans drink the diminutive espresso that made the Nespresso brewer a hit. Conversely, the Keurig device doesn't sell in Europe.

"We've always had competition in this space," Nestlé CEO Mark Schneider says. "The in-home trend plays to our strength and away from others who are more out-of-home focused. It's not that we're exactly shaking in our boots."

The capsule coffee machine segment of the \$6 billion coffeemaker market, which Keurig dominates in the U.S. with a presence in more than 30 million households, is expected to be the fastest-growing because of their ease of use, according to an analysis by Grand View Research. But manufacturers of single-use pods have come under fire for their toll on the environment, with millions of plastic or aluminum capsules piling up in landfill every year. Along with industry peers, Keurig Dr Pepper is taking steps to address that burden by committing \$10 million over the next five years to improve recycling of polypropylene plastic in the U.S. By the end of this year, the company aims to make all its pods from recyclable

● Number of U.S. households with a Keurig coffeemaker

30m



KEURIG: PHOTOGRAPH BY RYAN DUFFIN FOR BLOOMBERG BUSINESSWEEK; MACKAY: PATRICK T. FALLON/BLOOMBERG

polypropylene plastic. Although Keurig Custom Smart will initially be limited to a few thousand units, it marks the business's first serious attempt to tap into the demand from those discerning drinkers for smarter brewers that can re-create a barista's standards without any of the effort and from the comfort of the kitchen counter.

"Having better coffee at home has really moved up in terms of consumer priorities," says Jeffrey Young, founder of Allegra Strategies, a consultancy focused on coffee. "Their relationship with coffee had always been kind of a functional one, and now it's more of an experiential one, with a clean, stripped-back, minimalist approach where you deal with all of it on your phone."

Two years after the merger of Keurig Green Mountain coffee dispensers and soft-drink giant Dr Pepper Snapple Group, the new machines mark the company's most significant rollout under the roof of JAB Investors. That consolidation was spearheaded by Olivier Goudet, a Frenchman who in 2012 embarked on a seven-year takeover spree to consolidate the sprawling coffee industry.

In upgrading the roster of products by connecting more of them to the web, Gamgort also sees an opportunity to monetize the data the machines send back. Starting in 2017, Keurig Dr Pepper installed more than 10,000 connected brewers in American households on a one-way basis: Customers couldn't yet customize their coffees from their phones, but whenever the machine would brew a cup, it would send a notification to the company in less than a minute of the drip detailing which pod had been used at which location at what settings.

Access to that real-time information, called "point-of-consumption" data, ranked Keurig Dr Pepper among the most proficient consumer-goods companies. When workers began cocooning at home earlier this year to help prevent contracting the novel coronavirus during their commute or at the office, Keurig Dr Pepper adjusted its supply chain and marketing priorities in line with the data it was receiving from the connected brewers.

"It served us remarkably well during the pandemic because we could see the surge in demand happening inside the homes well before it showed up in syndicated data or on order from a customer," Gamgort says. "That's just one example of being way ahead of the game in terms of daily demand." —*Thomas Buckley*

THE BOTTOM LINE Keurig has cornered the market for single-serve coffee. Now a more expensive machine aims to lure consumers who are pickier about how they brew their java.

BW Talks

John Mackey

Wrenching events like the pandemic put a business's commitment to its values to the test, says the Whole Foods Market CEO. But his company has stuck to its focus on healthy fare and small suppliers during the crisis. —*Carol Massar and Jason Kelly*



● Mackey, a vegan, co-founded Whole Foods in 1980 ● He sold the company to Amazon for \$13.7 billion in 2017, months after an activist investor pushed for changes ● Mackey in September released his latest book, *Conscious Leadership: Elevating Humanity Through Business*

How did the pandemic affect you?

Whole Foods has done a lot better than other businesses, because we weren't shut down. We saw our sales go up, and our online sales went way up. But it's been incredibly stressful on the company, make no mistake about that.

married 30 years. I love my wife, and I love maybe 99% of everything about her, and 1% I'm not so fond of. A merger's similar. Amazon has a different culture than Whole Foods. We love most things about Amazon, and they probably love most things about Whole Foods. But, you know, not everything.

Was there a leadership lesson here?

A company is ultimately about relationships, about trust, and about partnership. And the hardest thing in Covid has been the difficulty, other than virtually, to connect with people. More people may work at home when this is over, but in reality, if you're going to maintain a culture, you have to have people connecting with each other, and there's no real substitute for doing that in person.

So what works?

Amazon thinks long term, and they're enabling Whole Foods to think long term. We've had three major price reductions, we're beginning a fourth. They're making investments in technology for Whole Foods that I think will be transformative. And they've been respectful of our culture; they haven't tried to just turn us into Amazon. So the best way to answer that question is, "John, if you could do it all over again, would you make the same decision?" And the answer is, yes. It was the right decision for us.

How is the merger with Amazon going?

A big merger is a little bit like a marriage. I've been

● Interviews are edited for clarity and length. Listen to *Bloomberg Businessweek With Carol Massar and Jason Kelly*, weekdays from 2 p.m. to 6 p.m. ET on Bloomberg Radio.



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Google Makes Its Case

- The company will cite broad market definitions and privacy to fight U.S. monopoly suit

Google is expected in the coming days to be hit with the biggest U.S. antitrust lawsuit since the government went to battle with Microsoft Corp. two decades ago. Officially, the company hasn't laid out its legal arguments yet. But piecing together submissions to other antitrust authorities, executive blog posts, and congressional testimony gives a picture of Google's strategy.

Justice Department investigators have been probing whether the Alphabet Inc.-owned company uses its dominance of online search, web

browsers, and advertising technology to unfairly block out rivals, pressure businesses into buying more ads, and benefit the rest of its digital empire, people familiar with the investigation have said.

Google has already sought to discredit the foundation of these arguments. "We don't agree that we're dominant. We don't agree that there isn't a ton of choice," Don Harrison, head of corporate development, said during a Sept. 15 congressional hearing. Although Google controls about 90% of the search engine market, consumers get information online in other ways as well: They look for news on Twitter, gift ideas on Pinterest, and products on Amazon.com, the company has argued. This is a common tactic in antitrust cases. Regulators try to define a market narrowly to illustrate a lack of competition, while corporations create a universe of rivals that's as wide as possible.

Google has also leaned on another major theme in tech regulation as a defense: privacy. Sometimes the company has to change its services to limit sharing of consumer data online or improve user privacy in other ways. That can hurt rival businesses. Google executives have privately complained about being stuck in a "damned if you do, damned if you don't" situation. If the company shares less data, advertising rivals and partners shout antitrust. If it opens up, privacy advocates cry foul.

In January, Google said its Chrome browser would eliminate trackers used to measure ad performance within two years, because consumers ▶



◀ don't like being followed around the web. Chrome is the most used U.S. browser, so that would represent a seismic shift for the industry; and dozens of rival ad-tech providers have had to rush to find alternate ways of operating or risk becoming obsolete. Most of Google's business is less reliant on these trackers, which means it's set to gain at the expense of smaller competitors with fewer ways of targeting and measuring data. It's also used privacy to defend its decision to limit rival ad-tech providers from accessing its YouTube platform, the world's largest online video service.

Google's ad-tech business handles almost every part of the process of buying and selling display ads online. Competitors, advertisers, and publishers have complained that its tools don't always plug in easily with products from other companies, pushing the entire ecosystem toward Google.

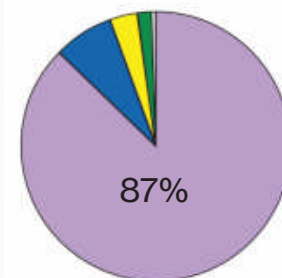
In a May 2019 report to the Australian Competition and Consumer Commission, a lawyer for the company used 67 footnote-filled pages to argue that its ad-tech business supports competition

rather than quashes it. Individual competitors or customers may feel certain actions are unfair, but that's because Google has to balance it all, the report said. Benevolent keeper of the internet is a role Google repeatedly assumes in its defense. Search, YouTube, Maps, and Gmail are all free for ordinary users and directly benefit small businesses, Chief Executive Officer Sundar Pichai told a congressional hearing in July.

The pandemic's forcing more businesses online has become part of this argument, too. "Nearly one-third of small-business owners say that without digital tools they would have had to close all or part of their business during Covid," Pichai said. He characterized his ad-tech empire almost as if it were a charity set up for the good of the broader internet. "It's a low-margin business for us," the CEO said. "We do it because we want to help support publishers." —*Gerrit De Vynck*

THE BOTTOM LINE Faced with an antitrust probe, Google is building a case against accusations it's abused its dominance and hurt consumers by arguing that many of its services are free.

▼ Search engine market share, U.S.
 ■ Google
 ■ Bing
 ■ Yahoo!
 ■ DuckDuckGo
 □ Other



Marathons Get a Second Wind

● Die-hard runners are finding virtual races the next best thing in the Covid era

Each August, in normal times, about 13,000 people run 7 miles up the Massachusetts coastline as part of the Falmouth Road Race. To kick off this year's event, my wife held a watch in the air and yelled, "Go!" I took off running down a narrow trail where we live—in Munich. I'd always been skeptical of virtual races, which allow runners to participate from afar. Why pay someone a registration fee to run around your own neighborhood?

Dave McGillivray was skeptical, too. A race director for four decades, he stages annual competitions including Falmouth and the Boston Marathon. This was supposed to be his biggest year yet, with 35 events across the U.S. At age 66 he'd begun to consider selling his company, DMSE Sports, and retiring. "Then along came this pandemic," he says. "It really fried this business."

Virtual races have existed for years, offering those who couldn't participate in an event in person, or preferred not to, the chance to run the specified distance on their own and upload their time. But the trend has exploded in 2020 because of

Covid-19, with big, established races including the Boston and New York marathons going exclusively virtual. Organizers have responded by sending commemorative T-shirts and race medals to participants and trying to create a buzz on social media.

Getting marathons and other popular road races back is, of course, not a high priority for Covid-conscious public officials. Even with careful planning, it's hard to imagine cramming together thousands of people who are breathing and sweating on one another for several hours (to say nothing of portable-toilet dynamics). The lack of big running events—and lack of clarity about when they'll be back—has been a blow to many, not least the charities that raise lots of money through the sport. In 2019 the Falmouth race collected \$5 million for nonprofits, while the Boston Marathon raised almost \$40 million.

The proliferation of virtual races is helping soften that loss—and offering runners a way to capture some of the thrill of participating in such events. "I never imagined in my wildest dreams

◀ McGillivray trains near his home in North Andover, Mass.



● 2018
Boston Marathon

Countries represented

99

Estimated spectators

500k

Charity impact

\$37m

Economic impact

\$201m

that runners would really gravitate to this," McGillivray says. "But I can understand it now because, what else is there?"

About 18,000 people paid \$50 each to participate in September's virtual Boston Marathon. That's about 40% fewer runners than took part in the 2019 race, when the fee was \$200 for U.S. residents (and \$250 for everyone else). For the virtual New York City Marathon, which can be done anytime from Oct. 17 to Nov. 1, people can pay as much as \$175 for guaranteed entry into a future race along with perks, including a subscription to the training app Strava. The London Marathon will be held in a hybrid form on Oct. 4, with elite runners racing on a closed loop in St. James's Park, while everyone

else pays about £20 (\$26) to complete the distance on their own.

In 1978, McGillivray quit his Boston office job and, over 80 days, ran across the U.S. to raise money for cancer research. Then he opened his own shoe store and put on road races to promote it, eventually deciding to focus on organizing the events. As Americans flocked to the sport, his company grew in good economic times and bad. "This business was bulletproof," he says. Until this year. The virtual Falmouth race had about 10,000 participants and had raised about \$1.7 million for charity as of early September. McGillivray expects his revenue to fall by two-thirds in 2020, torpedoing any notion of selling his business soon. ▶

◀ The hardest part, he says, is not knowing when he'll be able to put on another massive event, or whether the enthusiasm for the virtual substitutes will last. He derives some comfort from the fact that more people seem to be running these days as they grow more health-conscious and wary of gyms. In August, in the lead-up to Falmouth, McGillivray filmed a promotional video for racers laying out the new reality. "Each one of you are your own race directors," he says. "It's up to you to decide how exactly you want this to go." —*Tim Loh*

THE BOTTOM LINE Organizers of marathons, which bring together thousands of runners and spectators, are adapting to online races, which don't generate the same economic impact as real ones.

License Plate RE4D3R5 for All



● Cheap scanning technology raises concerns over invasions of privacy

Police have long relied on license plate readers to investigate crimes. Now the technology is coming to the masses—and the trend is sounding alarm bells for privacy experts.

Maryland-based Rekor Systems Inc. has started offering home video surveillance software through a service called Watchman, starting at \$5 a month. In addition to reading a license plate, the system can record a vehicle's make, color, and body type. This month, Rekor will launch what it says is a "first of its kind" mobile app, which will let users scan license plates with their phone camera. The app could come in handy for schools, to "securely identify valid visitors for student pickup lines" or to manage cars in parking lots, among other uses, the company says.

The rise of more casual and cheap surveillance is putting tools once primarily used by law

enforcement into the hands of virtually anyone. Privacy advocates worry about how personal information will be stored, shared, and used in the absence of clear legal protections.

Some fear the plate readers could be used to intensify racial profiling. "With residential racial segregation being what it is, it's not hard to imagine who's going to be immediately flagged as suspicious and then subject to police scrutiny potentially," says Nathan Freed Wessler, an attorney at the American Civil Liberties Union.

The U.S. has a patchwork of laws governing the use of license plate readers. At least 16 states have restrictions, according to the nonpartisan National Conference of State Legislatures, including Tennessee, which says the data can only be stored for 90 days. Other states—Maine, for instance—just allow readers for certain public safety purposes.

"As companies get their software hooked up to more and more peoples' cameras that are already out in the wild, we're going to see these databases grow in really robust ways, which is troubling," Wessler says. "The data can reveal information about how someone's living their life, and all that data is sitting on servers of companies. And there's not very clear legal protection for a lot of that data."

Rekor Chief Executive Officer Robert Berman says privacy is a "big concern" that the company is doing everything possible to address. It's only fairly recently entered the market, which includes Motorola's Vigilant Solutions, Rome-based Leonardo SpA, and other more established companies with stronger links to police departments or the defense industry. While Rekor serves other markets, too, it's more focused on businesses such as restaurants and financial institutions, Berman says.

In September, Mastercard Inc. announced its AI Powered Drive Through platform, which uses Rekor technology to allow restaurants to build customer profiles from license plates. Restaurants can be notified when a regular customer arrives, display the person's menu favorites, and pull up payment details. Starting this month, select White Castle fast-food locations will begin testing the readers.

According to Berman, Rekor envisions its software being used to streamline transactions such as paying for gas. A camera next to the pump would scan your license plate and match it with pre-stored payment information. Privacy issues aside, the company sees an added benefit to its technology during the Covid-19 pandemic: It's touchless. —*William Turton*

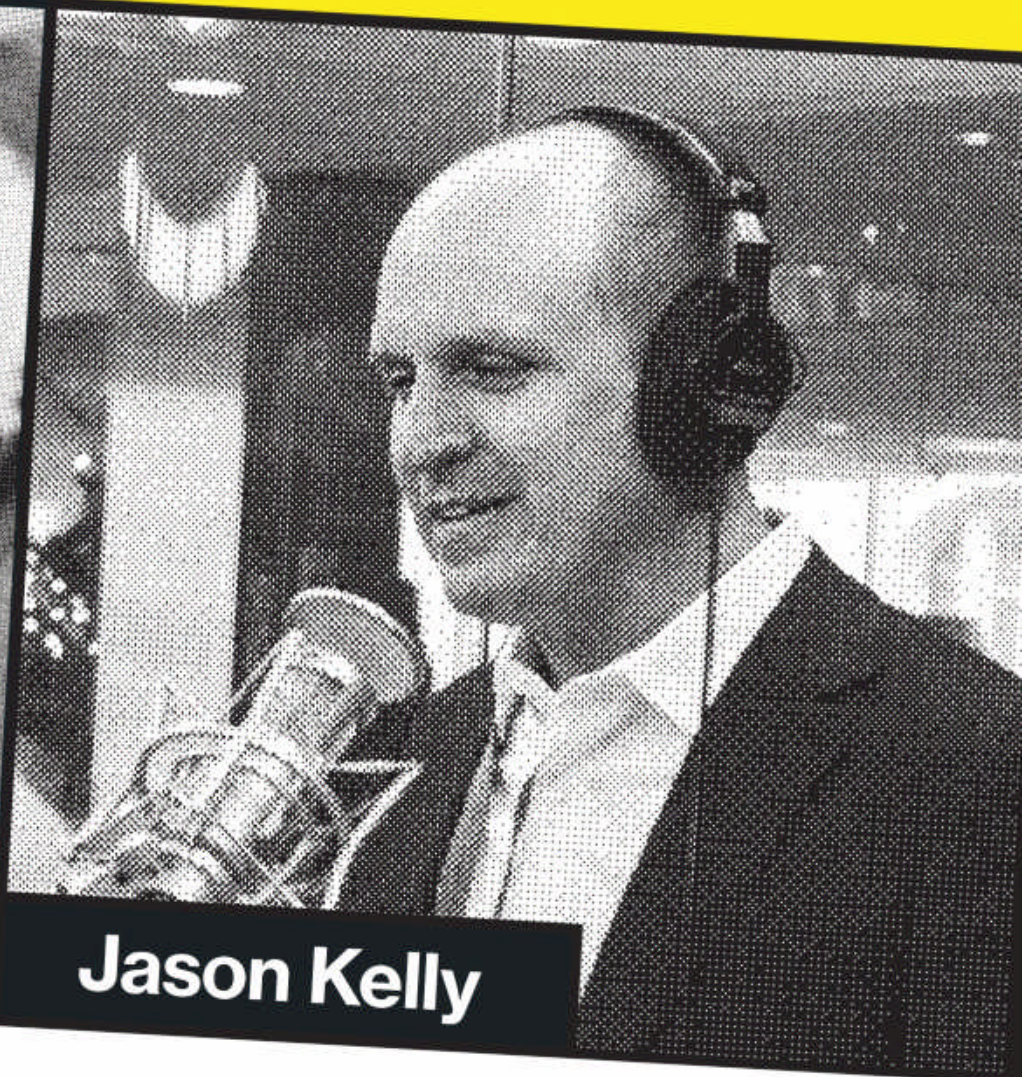
THE BOTTOM LINE License plate reader technology, which had largely been the preserve of police, is now being marketed to everyday users and businesses, raising privacy concerns.

◀ Rekor surveillance cameras come with vehicle recognition software

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College Interrupted

● The pandemic has stirred interest in tuition insurance, but it doesn't cover all the risks

With Covid-19 infections spreading on many college campuses, parents are naturally anxious about their kids' health. But there's a financial worry, too. Marcy Fischer's daughter attends Emory University in Atlanta, where covering her off-campus lease, plus tuition, would come to about \$30,000 for one semester. "You know, if they just get sent home from school and go virtual, that's one thing," says Fischer, who lives in Brookline, Mass. "But if they were to get sick and have to

withdraw from university for the semester, we'd be out that money.”

To cover that risk, Fischer bought an insurance policy. The plan, from Boston-based GradGuard, can cover unrefunded tuition expenses and other costs if the student is too sick to finish the semester. At a school such as Emory that's teamed up with GradGuard to sell the plans—there are more than 350 such partnerships—up to \$30,000 of coverage would cost about \$300. The policies, which are underwritten by Allianz SE, are more expensive if purchased individually. They're bought or renewed each semester and must be purchased before the first day of classes.

John Fees, chief executive officer of GradGuard, says demand has jumped in the past few months as the pandemic has made the financial risk of high college costs even more vivid. “Families are more aware than ever before of the risks of paying for college,” he says. But whether Covid-19 is a good reason to shell out thousands of extra dollars over the course of a student's college career for insurance is a more complicated question, experts say.

For one thing, such policies typically require the circumstances for withdrawal to be unforeseen, says Loretta Worters, spokeswoman for the Insurance Information Institute, a trade group. The Covid outbreak began well before the current school year. “Epidemics and pandemics are typically excluded from tuition insurance,” she says.

How companies will cover Covid-related illnesses is a mixed bag. Liberty Mutual Insurance, another insurer offering tuition insurance, says it doesn't cover Covid, while A.W.G. Dewar Inc., which offers plans via schools, says it's treating it like other illnesses that might cause a student to withdraw.

In a coverage alert on its website, GradGuard notes that Covid claims are “not covered under most plans” because of the exceptions for epidemics and foreseeable events. But the company says it's choosing to accommodate claims for students who completely withdraw from school due to becoming ill from Covid. Fees says the company is monitoring losses and expects to be able to continue paying such claims, but that in future semesters it may limit this to policies offered through participating schools.

Financial planner Andrew Komarow, co-founder of Tenpath Financial Group, recommends being cautious before buying a policy. Parents should bear in mind that coverage generally only kicks in if the student is too sick to be in school at all. While Covid infections are serious—and pose a risk that a student will spread it in the community—younger people tend to have milder symptoms. So they may end up continuing school remotely. “That

doesn't mean school's canceled,” Komarow says.

Michael Kovalev, owner of Kovalev Insurance Agency Inc., calls tuition insurance a niche product that some people may find useful. “But I also don't think the price tag is small,” he says.

To be sure, just because a financial risk is comparatively low doesn't necessarily mean it's not worth insuring—especially if the potential cost could be devastating. In addition to Covid, tuition insurance can cover withdrawals due to other types of illness, including mental health conditions in some circumstances. “It's certainly an affordable alternative for families to protect what is often the second-largest investment in their lives,” Fees says. According to the College Board, full-time students at private four-year colleges pay, after aid, an average \$27,400 per year including room and board. In-state students at public four-year colleges pay \$15,400.

Fees stresses that tuition insurance won't cover costs if a school ends in-person classes and tells students to continue classes virtually—a situation that leaves many kids and their parents wondering if it wouldn't be better to take a gap year. “It's a medical withdrawal, not a change in how schools teach,” he says of the coverage. “It's not a business interruption insurance.” Nor does it cover costs for students who are suspended or expelled for violating campus rules to prevent Covid's spread. In September, Northeastern University in Boston dismissed 11 students who had gathered in a room at a hotel being used for temporary student housing. They weren't refunded \$36,000 in tuition.

“There's so many reasons kids do drop out of school, although I would say the primary reason kids drop out of school is typically not because of an illness,” says Jane Klemmer, founder of Klemmer Educational Consulting, which counsels families on admissions and paying for college. “Once people start to read the small print of what's covered and what's not, that could be a deterrent,” she says of tuition insurance.

Whether it's bad grades, a poor college fit, or just wanting to do something else, 19-year-olds have plenty of ways to disrupt families' financial plans, and most of those ways can't be covered by insurance. That's something parents can consider along with the aid package when deciding if a particular school is within financial reach—can we still afford it if there's a rough semester along the way? Now Covid and its many disruptions to campus life and learning have added a new variable. —*Olivia Raimonde, Janet Wu, and Katherine Chiglinsky*

THE BOTTOM LINE Covid outbreaks on college campuses have put into focus how costly it can be for parents when a student is forced to withdraw.

● Average annual cost of a private four-year college, after aid, with room and board

\$27k

Investor Protection— Or Saber Rattling?



● The Trump administration wants more scrutiny of U.S.-listed Chinese companies' books

Interior designer Kim Bondy had never heard of Luckin Coffee Inc. when, she says, her financial adviser suggested investing in the fast-growing chain, often referred to as the Starbucks of China. The idea couldn't have come at a worse time.

Shortly after her purchase of Luckin's stock, the company disclosed that top executives had fabricated a chunk of its 2019 revenue. The shares, trading on the Nasdaq Stock Market, were subsequently suspended and have dropped almost 90% since April 1, leaving Bondy with an \$85,000 loss. "It's caused horrific financial stress," says Bondy, who sold her house and vacation home to pay down a credit line.

Like many investors, Bondy assumed that Chinese companies trading on U.S. exchanges and recommended by brokers like hers at Morgan Stanley are subject to the same oversight and regulations as U.S. businesses. That's not the case, however, especially when it comes to federal protections designed to ensure thorough audits of public companies and prevent frauds like the one being probed at Luckin.

Propelled in part by Luckin's collapse, but also by the U.S.'s increasing tensions with Beijing, lawmakers and the Trump administration are working to patch loopholes that have given Chinese companies that sell stock on American markets the ability to shield their financial records from U.S. inspections. Yet investor advocates say they remain pessimistic that the political momentum is enough to overturn years of government inaction supported by much of Wall Street, which profits from the lighter regulatory touch and doesn't want the status quo disrupted. "The problem is that it has been going on for so long," says Lynn Turner, a former chief accountant at the Securities and Exchange Commission.

The audit issue dates to the 2002 Sarbanes-Oxley Act, passed in the wake of accounting scandals at Enron Corp. and WorldCom Inc. The law ordered publicly traded companies' accountants to submit to regular inspections from U.S. regulators—reviews that include poring over corporate financial documents. While more than 50 foreign jurisdictions permit the inspections, China has refused, citing strict confidentiality laws. The U.S. government has tried

to negotiate a compromise for more than a decade, but it's allowed Chinese companies to continue tapping American markets.

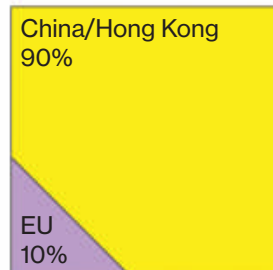
For investors chasing the next Baidu Inc. or Alibaba Group Holding Ltd., it's caveat emptor, a point underscored recently by SEC Chairman Jay Clayton. "If you're a U.S. investor and you invest in a non-U.S. entity and you're defrauded, the chances you're going to get your money back are extremely low," he says. Clayton has also said that brokers and investment advisers should be aware of such risks when making recommendations.

The SEC has long been part of the acquiescence, routinely signing off on Chinese companies' requests for initial public offerings even as the agency's enforcement lawyers continue to file cases against Chinese-based corporations that tanked after accounting irregularities. The regulator also closely supervises U.S. accounting firms, especially PwC, KPMG, EY, and Deloitte—the Big Four that audit most public companies. Their affiliates in China are major holdouts on inspections. The SEC tried to remedy this by suing them in 2012. The case ended in a settlement where the firms agreed to turn over documents to the inspectors. Ultimately the Chinese firms didn't comply, and the SEC didn't reopen the case.

Meanwhile, investors' exposure to Chinese stocks is growing. According to the SEC, more than 150 of the country's companies, with a combined value of \$1.2 trillion, traded on U.S. exchanges as of 2019. IPOs are also continuing apace, with 20 already this year and more expected in the coming months. The agency also points out that not only are individuals buying shares of the Chinese-based companies, but pension funds and mutual funds, both actively managed and indexed, invest in them, too.

The investor protection issue has come to the fore as President Trump has worked to turn China into a focus of his campaign, blaming it for the coronavirus pandemic as he faces questions about his own administration's handling of the crisis. On Capitol Hill, separate bills have passed the House and Senate that would require stock exchanges to delist Chinese companies that don't get their audits

▼ Companies whose audits can't be inspected by U.S. watchdogs, by auditor location*



inspected. A Trump administration committee of top regulators called the President's Working Group on Financial Markets, which includes Clayton and Treasury Secretary Steven Mnuchin, proposed a similar approach in a report in August.

The legislation and presidential group's memo show that "Washington is finally serious about protecting America's mom and pop investors and stopping China's fraud on our markets," says Chris Iacovella, head of the American Securities Association, a trade group of midsize brokerage firms that's been pushing to curtail what it sees as China's exploitation of U.S. investors. "Enough is enough."

Still, Iacovella and others involved in the fight are warily watching the opposition. That includes investment banks that take Chinese companies public, stock exchanges that get paid for the listings, and asset management firms that sell popular emerging-market mutual funds. Many finance companies, too, have their own business in China that they don't want caught up in tit-for-tat warfare between the two governments.

Well aware of most politicians' sentiments toward China, the Wall Street players aren't taking public lobbying positions against the delisting plans. They've already won an important concession: time. Even if legislation passes, it will take years before any Chinese companies are tossed from U.S. markets. The SEC would also need to write rules governing the delisting process, which will give the industry another chance to influence the policy.

Major companies such as Vanguard Group, New York Stock Exchange, and Nasdaq highlighted some of their opposition during a July meeting held by the SEC that focused on investing in China. Among their biggest concerns is that Chinese companies would move their listings to Hong Kong or countries where investor protections are weaker than in the U.S. American investors, of course, would still be able to purchase the stock. The Trump committee of regulators also pointed out that potential in its report.

Nor is that just speculation. The year's most-anticipated IPO, China's Ant Group Co., chose to list on stock exchanges in Hong Kong and Shanghai. Yet in an illustration of how Wall Street benefits even when U.S. markets are bypassed, Citigroup, JPMorgan Chase, and Morgan Stanley were hired as underwriters for the Hong Kong part of the offering.

Although SEC Chairman Clayton has come out in support of the delisting option, the agency continues, as it did under his Democratic and Republican predecessors, to give Chinese companies a green light to sell shares on U.S. exchanges even though it's widely known they won't comply with the audit inspection rules. Clayton, who as a deals lawyer helped Alibaba

in 2014 when it launched what was then the biggest IPO in history, didn't signal that cracking down was a major priority for him when he started as SEC chairman three years later. As he settled into the job, agency staff presented him with a report on possible solutions to the audit inspections stalemate with China, but he didn't take any action, according to a person familiar with the matter.

"Within two months of joining the SEC in 2017, Chairman Clayton was raising these issues directly with Chinese regulators," says Chandler Smith Costello, a spokesperson for the SEC. "This direct engagement has continued over the entirety of his chairmanship." Clayton ratcheted up the rhetoric as the Trump administration soured on China. He and William Duhnke, head of the Public Company Accounting Oversight Board, the agency charged with policing auditors, issued strongly worded policy statements in 2018 and 2020 warning investors about the "risks and uncertainties" and stressing that regulators have less visibility into Chinese companies' books.

China says it would like to reach a deal and is negotiating in good faith—it's proposed joint inspections by the PCAOB and Chinese regulators. But Duhnke isn't optimistic about landing an agreement with China to allow audit inspections. In a letter in July, he told the president's working group that China is the only foreign jurisdiction that has refused "to cooperate meaningfully," despite efforts including a pilot program and years of talks at many levels of government.

As for Bondy, who took a big hit on the Luckin coffee chain, she's pursuing an arbitration claim against Morgan Stanley and her broker for allegedly recommending an unsuitable security. Morgan Stanley declined to comment.

The SEC is investigating Luckin, which is just the latest example of a Chinese-based company attracting millions of American investors before cratering in a financial fraud. The list includes well-known companies such as Sino-Forest, Longtop Financial Technologies, and AgFeed Industries.

This hasn't stopped some investors, including Billy Heanue. The 27-year-old says he lost about \$2,000 investing in Luckin. The loss "has made me more cautious to invest in companies in China," Heanue says, but he still holds shares in IQiyi, the so-called Netflix of China, which he started buying in 2018. In August the company said that the SEC has opened an investigation into its accounting practices. After an initial plunge, its shares have rebounded. —*Robert Schmidt and Matt Robinson, with Ben Bain*



● Clayton

THE BOTTOM LINE The Luckin scandal and the Trump administration's anti-China rhetoric have helped turn audits into a hot issue. But change may be slow to arrive.

The Scars Of Japan's Employment Ice Age

Japanese open up about the difficulties they've faced
in charting career paths

By Yoshiaki Nohara Photographs by Shiho Fukada

The doors open only once. That's how people often describe Japan's hidebound hiring system, in which college students have their best shot at landing a coveted salaried position in the year approaching graduation. Those who successfully navigate the arduous corporate recruiting process will be rewarded with a secure place on the corporate ladder, along with regular raises and promotions. The rest are largely condemned to flit from one low-paying job to the next, with little avenue for advancement and zero job security.

The divide was solidifying when I finished college in 2000. It had been a decade since Japan's bubble economy had collapsed, and employers drastically scaled back new hires to protect older workers. The labor market had entered an "ice age," according to media reports.

Having watched my older brother struggle to establish himself in a career, I chose to emigrate to the U.S. to pursue my interest in journalism. Over the years, I read stories about the travails of the so-called lost generation. Faced with limited job prospects, many ended up single and childless. Japan's 2015 census revealed there were 3.4 million people in their 40s and 50s who had not married and lived with their parents.

It was a brutal knife attack in May 2019, in which the perpetrator was a man in his 50s who had been out of work for many years and living with relatives, that got me thinking about profiling

people whose lives had been disrupted by the employment ice age. From a news perspective, the timing was propitious: A month after the attack, the government unveiled plans to help those who were shut out of the labor market in their 20s land full-time positions, with a goal of assisting 300,000 over three years.

There was no shortage of potential subjects for my project. Japan has an estimated 613,000 middle-aged *hikikomori*, a term usually used to describe socially withdrawn adolescents who hole up in their bedrooms, according to the results of a government survey released in March of last year. Among those in their early 40s, as many as one in three said they had become shut-ins because they had trouble finding or settling into a job after finishing school.

Locating interview subjects didn't prove as difficult as getting them to open up to a journalist. It helped that we were of the same generation. Still, many were so deeply ashamed about their failure to become successful adults in the mold of their parents that our conversations were awkward and painful. I was heartened when a social worker put me in touch with a client who was undergoing rehabilitation to reenter the work world and also when I met hikikomori who had overcome their own isolation and were helping others do the same. Those encounters left me hopeful that for a few, the doors might open once again.

The 8050 Problem

It took a gruesome crime to get Michinao Kono to take control of his life. In May 2019 a knife-wielding man attacked a group of people waiting at a bus stop in Kawasaki, killing two and wounding 18 others, including more than a dozen school children, before stabbing himself to death. News cov-

shut-in, because my economic situation is heading for a dead end,” he says.

Kono seemed destined from birth to have a promising future. His father was employed by one of Japan’s legendary trading houses, the industry-spanning conglomerates that were the backbone of the postwar economy. He earned enough to afford a car and a home with a front yard, which marked the family as well-to-do in a country that embraced the phrase “100 million, all in the middle class.”



erage alluded to the “8050 problem,” a reference to reclusive, middle-aged Japanese who live with their elderly parents.

The label applied to Kono, an out-of-work 45-year-old who never left his parents’ home in Nara. He was rattled by the thought that Japanese society viewed people like him as ticking time bombs. “There’s no chance I would commit a crime like this, but I thought, I have to stop being a

Kono himself got into Kyoto University, Japan’s second-oldest university and one of its most selective, but his lack of social skills made him a loner. He says that was a result of being bullied in middle school.

During his third and fourth years in college, Kono’s mailbox started overflowing with recruitment brochures, same as the rest of his classmates. (Even during the economic malaise of the 1990s, ►

▲ Kono never moved out of his parents’ home

◀ Kyoto University students were in demand.) Still, he didn't take part in the highly choreographed ritual called *shushoku katsudo* ("job-hunting activity") in which university students don black or navy suits to attend packed recruiting events and submit to marathon group interviews.

Kono frequently skipped classes, so that after eight years at university he still hadn't accumulated enough credits to graduate, which made him ineligible to stay on. By that time, the stream of pamphlets had dried up, and he made no attempt to look for work. "It was in the employment ice age," he explains. "I thought even if I tried, it would be in vain."

He holed up in his parents' house. Days became weeks became months became years. When he felt up to it, he'd attend concerts by the all-girl pop group Morning Musume. He booked himself on cheap flights to East and Southeast Asia. "In my mind, I knew I was going nowhere and I'd better quit," he recalls. His parents gave him money for incidentals, and he paid for more expensive items with credit cards, racking up about 3 million yen (\$28,400) in charges before defaulting. Now he and his parents live off Kono's father's pension. "I dug my own hole. I avoided reality. My life derailed quite a bit," he says.

Amid the coverage of the knife rampage, Kono came across Takaaki Yamada, who runs a nonprofit in Kyoto, an hour's drive from Kono's home. The group reaches out to middle-aged shut-ins and their aging parents and hosts meetings where they get together and share their stories. "Many parents are truly devastated with their children being withdrawn for a long time," Yamada explains. "We have to connect with them" before the parents die and their children are left behind. (It was Yamada who put me in touch with Kono.)

In the summer of 2019, Kono applied for three clerical jobs that the city of Takarazuka created to help people frozen out of the job market during the employment ice age. He had no idea he'd be competing with 1,815 other applicants from all over Japan.

Takarazuka's mayor, Tomoko Nakagawa, who is 73, says she regrets not having done more to address the diminishing career prospects for this generation when she was a national lawmaker from 1996 to 2003, even after watching her own son and daughter, now in their 40s, struggle to find jobs. "I didn't see the essence of this problem," she says. "This is the generation that was forced to swim in the murky water."

Kono didn't land one of the spots, which would have required him to rent an apartment for himself for the first time to avoid a 90-minute

commute each way. In November he took a job as a dishwasher at a ramen restaurant, thinking that if he learned the ropes, he might be able to run his own eatery one day. He spent long hours on his feet, often working past midnight, and earned roughly 150,000 yen per month, just slightly over minimum wage. He quit in early January. "It wiped me out physically," he says.

At Kono's invitation, I travel to Nara in mid-January to attend a session of the self-help group he's been leading since July 2019. The gig is unpaid, but it motivated him to get business cards printed, and it adds a line to his bare résumé as he looks for regular work.

When I arrive at the address he's given me, I climb the stairs and see a sign that reads "Meeting Room 3: A Citizens' Group to Consider the 8050 Problem." Besides Kono, the room holds 10 other people. He kicks off the session by recounting his own personal story. A 33-year-old man then says he's been homebound for several years since dropping out of graduate school. A 46-year-old woman living with her mother says she's too weak to work after being a shut-in for years. A 44-year-old man with a college degree wonders how long he can stand doing menial work, such as distributing flyers.

A man in his late 70s talks about his son, who since failing a college entrance exam two decades ago spends his days in his room, most likely watching TV and surfing the internet, he says. "Do you talk with him about what he wants to do in the future?" Kono asks, sitting at the table with his arms crossed. The father says they had once, but not any longer. When Kono asks if the young man has any friends, the older man answers, "None."

As I listen, I remember a conversation in which Kono told me his father used to hassle him about getting a job, but the two of them no longer talk about the future. He told me he's more conscious that his parents are nearing the end of their lives: His father no longer drives, and his mother's spine is bent with age. "I'd like to get back on my feet and assure them while they are alive," he said.

When I check in with Kono in September, he tells me the monthly gatherings he organizes were canceled from March through May because of the pandemic but resumed in June. He's applied for several government clerical jobs earmarked for members of the lost generation. He was turned down for three and is waiting to hear back on others. He says that with private companies cutting back hiring during the Covid-19 recession, programs like these are probably his only option: "This is my last chance to reenter the society."

"I dug my own hole. I avoided reality. My life derailed quite a bit"

For Women, Mostly Dead-End Jobs

On paper, Yu Takekawa is the embodiment of the liberated Japanese woman, a still-rare species in a country where traditional attitudes about gender roles have been slow to evolve despite government policies designed to speed change. She has a master's degree, worked full time at four companies, and published two novels.

her at home in Yokohama in July. "My job hunting was going nowhere during the pandemic."

I first interviewed Takekawa in January, at a youth center in Yokohama that also offers career counseling. She asked to be identified by her pen name only. A few weeks earlier, she'd been notified that her work contract at a trade publisher would not be



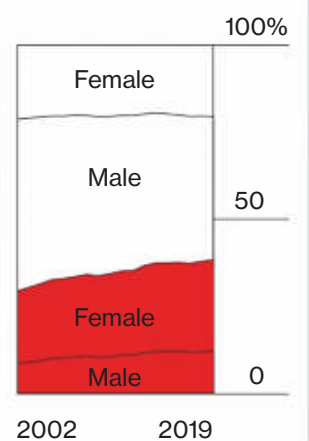
◀ Takekawa lost her contract job in March

In reality, Takekawa, 38, has been unemployed since March and scrapes by on her unemployment benefits and savings. She regularly skips dinner to save money, and she can't remember the last time she took a vacation. Her one consolation is that the pandemic has allowed her the time to finish writing her third book, which will net her a modest sum when she delivers it to her publisher. "Without the novel, I really think my life would've gone off the cliff," Takekawa said when I called

renewed in the spring, and she didn't want friends and acquaintances to know her predicament.

Like many in her generation, Takekawa has struggled to find her footing in the work world. She attended Rikkyo University, a well-regarded liberal arts school in Tokyo, and began job hunting while still a junior, as is customary in Japan. Although she'd chosen to major in German literature, she made the strategic decision to seek employment at a distribution company, because she figured ▶

▼ Share of Japan's employed workers
 Regular workers*
 Contract and other



*FULL-TIME WORKERS WHOSE EMPLOYMENT IS NOT LIMITED IN DURATION. DATA: MINISTRY OF INTERNAL AFFAIRS AND COMMUNICATIONS

◀ these types of businesses had better odds of surviving Japan’s recurring recessions.

A law that sought to ensure equal employment opportunities for women had been in place for almost two decades, but old customs and habits persisted. Takekawa recalls that during group interviews, recruiters peppered the male candidates with questions and turned to the women as an afterthought. “I felt women were not even considered,” she says. “I figured I wouldn’t make it.”

When no offers materialized, Takekawa enrolled in a graduate program in German literature, hoping the job market would improve by the time she needed to resume her search. In the spring of 2005, she was standing on a train platform when she was overwhelmed by anxiety. Her hands trembled, and she was drenched in sweat. Doctors returned a diagnosis of panic disorder. “It’s never been cured completely,” she says.

After completing her studies, Takekawa landed a full-time job at a large homebuilder in Tokyo, editing brochures and catalogs. Her father had worked as a salesman for the same employer his entire adult life, and his 24-year-old daughter assumed she’d be able to do the same if she so desired.

But there was a catch: Takekawa’s position was noncareer track. Almost all previous hires had been single women who still lived with their parents, which is why the job paid 30% less than what male colleagues earned in career-track jobs doing essentially the same work. The expectation was that the women would quit once they wed. Frustrated by the lack of prospects, Takekawa left after two and a half years.

The pay at her next job as a reporter at a trade newspaper, was better. And she was spared the indignity of having to serve tea to her male colleagues. But Takekawa sometimes had to put in long hours at the 15-person business, which negatively affected her health, she says. She began taking antidepressants and quit at the end of 2010 so she could return to Yokohama. “I thought I needed to move closer to my family,” she says. “I needed to rest.”

By then, Japan’s first lost decade had stretched into a second. To cut costs and protect older workers, businesses resorted to temporary contracts, which offer less pay and skimpier benefits. Those jobs are the first to be cut during a downturn but also the first to be added back during a recovery. A new underclass of nonregular workers was created, which today makes up about 40% of Japan’s labor force. Women represented 68% of this contingent in 2019, Takekawa among them. Her most recent

job was at a Yokohama bureau of a newspaper that covers the construction industry. She worked there almost five years, but on six-month contracts. Her take-home pay was around 150,000 yen (about \$1,400) a month.

Still, the job had its benefits: Takekawa’s commute was short, and her working hours were fixed from 9:30 a.m. to 5:30 p.m., allowing her time to indulge one of her passions: writing fiction. She penned a short story that won an award in 2016 and then published two historical novels, which were written up in national papers. “It helps my mental health significantly that I can get paid for doing what I want to do,” she says.

Former Prime Minister Shinzo Abe frequently boasted that a record number of Japanese women found work outside the home during his tenure. His administration also pushed for equal pay for equal work. “They never helped me,” Takekawa says of Abe’s labor policies.

She’s been searching for work but is doubtful she’ll ever know the job security her father and others of his generation enjoyed. Takekawa used to think there was a reliable path for most people, including herself. “At some point it vanished for me,” she says before stepping out of the youth center and into the crowded street.

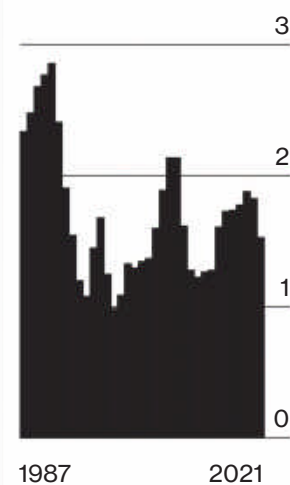
Creating a Safe Space

Inside the packed restaurant, about 40 people chatted and laughed, drinks in hand. It was November 2019—months before the world would learn that a lethal virus had been silently stalking humans—and this was Shibuya, a Tokyo district famed for its lively nightlife. Nobody would have guessed this was a gathering for shut-ins, or *hikikomori*, as they’re known in Japan.

“Listen up. Rice bowls with roast beef are coming,” called out the evening’s host, Wataru Kubo, commanding the crowd to chow down.

This is no 12-step meeting. There are no uncomfortable chairs, no stale coffee, no embarrassing public confessions. It’s OK if you don’t want to share your personal story—or even your name. A sheet posted near the entrance spells out some basic rules of engagement. No. 2 reads: “Nod a lot as you listen.

▼ Entry-level job openings in Japan per college graduate, by graduating year





Don't deny others even if you disagree with them."

Kubo, who started organizing the monthly gatherings in August 2018, wants the ambiance to be as relaxed as possible. He's succeeded: When I showed up wearing a suit and tie, a few people in the casually dressed crowd ribbed me for being so formal. "This is a place where people feel safe," he says. "This is also a place where they can network."

When I introduced myself as a reporter, some at the gathering fell into an awkward silence. But a few agreed to tell me about the unexpected turns that led them to this room. One 47-year-old man confided that he'd spent 17 years holed up in his room at his parents' place after graduating from college. Another, 39, told me he spent years moving from job to job and now lives in a homeless shelter.

"It takes a lot of energy to come here," says Kubo, 59, a business consultant. He recalls that as an adolescent he bristled at the idea that he'd one day be expected to take over his father's carpentry business, but at the same time he felt no pull to go into another profession. After graduating from high school, he became a recluse. Sometimes he would venture into downtown Shibuya at night to people-watch. "There was power in Shibuya with so many young people," he says. "That gave me comfort."

The monthly gatherings have been on hiatus since February because of the pandemic. "I was devastated in March and April," Kubo says when

we meet again in July. "I thought, What could we possibly do in a world where people can't get in contact with each other?" He organized an online event in May, he tells me, but it didn't feel intimate. He hoped to resume the monthly meetups this summer at the same restaurant, even if he had to limit the guest list to five. When he messaged me in mid-August, I learned that a resurgence of the virus had derailed his plans.

Shibuya, which was deserted during the seven-week-long state of emergency that ended May 25, doesn't have the same energy it did before the outbreak. It's not just concerns about becoming infected that are keeping the revelers at bay. Japan's economy contracted at an annualized rate of 28% in the April-to-June quarter, the most in the post-war period.

Some major employers, including Japan Airlines Co. and H.I.S. Co., have stopped recruiting college students, while almost 78% of respondents in a midsummer survey of small and midsize businesses by the Japan Chamber of Commerce and Industry said the pandemic is affecting their hiring of upcoming graduates. Recruit Works Institute polls university students and companies each year to gauge the number of entry-level openings per impending graduate. For the class of 2021, the ratio is set to dip to 1.53 jobs per graduate, from 1.83 this year. "It's like the employment ice age," Kubo says. "It's happening again."

▲ Kubo in Shibuya district

Retail Therapy

In January, I traveled to Osaka to meet Reiko Katsube, the social worker credited with coining the phrase “8050 problem” to describe the phenomenon in which middle-aged Japanese, usually unemployed and socially withdrawn, live under the same roof as their elderly parents.

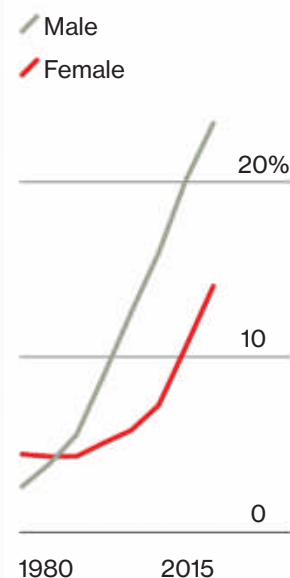
We agreed to meet at the offices of the Toyonaka Social Welfare Council, a private orga-

into her work outfit: black pants and a navy windbreaker with the council’s name printed on the back. Then she ushers me outside and into the van she uses to make her rounds.

As she drives, Katsube, who’s been working at the council for more than 30 years, explains that most of her time is spent out of the office, often visiting adult shut-ins living with their parents. Her organization began reaching out to this population in the aftermath of the 1995 Great Hanshin-Awaji earthquake (better known abroad as the Kobe earthquake). The disaster killed more than 6,000 people and forced hundreds of thousands from their homes, tearing apart neighborhoods and condemning many to live and die in solitude. “Since the quake, we have been striving to nurture connections in the community to prevent lonely deaths,” Katsube says. “We got to see the problem



▼ Share of 50-year-olds who have never married



◀ Junko at Bino Marche, the store where she works in Osaka

nization that works with government agencies and community groups to tackle issues such as elderly abuse and child poverty. The two-story concrete building is tucked into a neighborhood where the streets are narrow and winding and the skyline is filled with crisscrossing power lines. When Katsube arrives she briefly disappears to change

wasn’t just with senior citizens living alone or only with their spouses.”

We soon arrive at a small store called Bino Marche. Outside, under a red awning, are baskets filled with lotus root, mandarin oranges, and other fruits and vegetables. Inside, shelves are stocked with doughnuts, sodas, honey, and jam.

Katsube, who had a hand in creating the market in 2017 and now manages it, says its purpose is both practical and therapeutic. Bino Marche's customers are mainly senior citizens who can no longer drive or bike and need a local place to do their grocery shopping. Some of the employees are Katsube's social work clients. "They needed a place like this," she says. "So did the community."

Inside the store, I spot a woman serving coffee who's wearing the same navy windbreaker as Katsube's. Katsube introduces us, and the three of us retreat into a meeting room upstairs.

During our interview, the woman, Junko, readily volunteers her age—44—but asks that her last name be withheld because she's concerned about her privacy. Born and raised in the area, she studied illustration at a two-year college and aspired to become a manga artist, in part because she saw that the path to a more conventional career had narrowed during the employment ice age. "People a bit older than us were able to find a job easily, but I was hearing my friends failing after trying about 200 companies," she says.

After graduation, she accepted a part-time job stocking shelves at a grocery store, working early hours so she could spend the rest of the day drawing. When the store shut down, she focused on manga full time, but found she couldn't make a living from it. Over the course of a decade, she worked a series of clerical jobs, all low-paying and involving little training—and consequently offering no prospect for advancement. Sometimes, she quit after just one month.

Job interviews were particularly painful, she recalls. "Every time I was asked the same questions, and I gave the same answers. I got tired of presenting and promoting myself."

Junko says she became more and more withdrawn after turning 30. "I didn't want to deal with people," she says. "I didn't talk with anybody other than my family. I didn't want to think about my circumstances. I lived one day at a time." Concerned, her mother contacted the Toyonaka council, which dispatched Katsube on a home visit.

Junko recalls their first encounter four years ago, acknowledging that the prospect of meeting a stranger to discuss her life and career options held little appeal. She was pleasantly surprised when, after some small talk, Katsube asked her to draw manga for the pamphlets the council distributes. Junko says she kept her poker face, but her heart skipped: "I was pleased a little bit."

Manga turns out to be an ideal medium for tackling the sensitive subjects the council deals



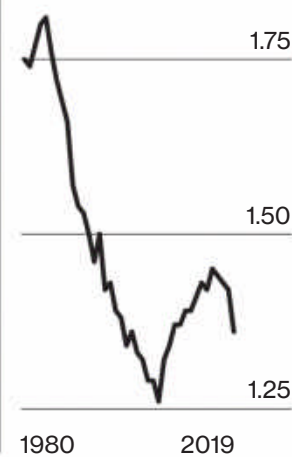
with. Under Katsube's direction, Junko also enrolled in a program that helps shut-ins learn social skills by engaging in activities such as gardening, music, sports, and volunteering. She also took a class in which she learned to design ad flyers on a computer. These helped her rebuild her self-esteem bit by bit. "It taught me I don't need to be afraid of people," she says.

Junko has been working part time at Bino Marche since 2017, serving coffee, stocking produce, and working the cash register.

After about two hours, Katsube leaves for another appointment, and Junko and I go back downstairs. By now it's mid-afternoon and a group of senior citizens is in the store's kitchen making pork curry and rice to serve to poor children. As the smell of sautéed onions fills the room, Junko tallies the day's sales. When asked how she likes her job at Bino Marche, she struggles for words: "How can I say? It's like I'm being healed there. It's a place where people accept me."

▲ Katsube has years of experience in rehabilitating shut-ins

▼ Fertility rate in Japan*



*AVERAGE NUMBER OF LIVE BIRTHS A WOMAN IS PROJECTED TO HAVE IN A LIFETIME. DATA: NATIONAL INSTITUTE OF POPULATION AND SOCIAL SECURITY RESEARCH (LEFT); MINISTRY OF HEALTH, LABOUR AND WELFARE (RIGHT)

A SEA CHANGE FOR THE SUPREME COURT

● The Sept. 18 death of Justice Ruth Bader Ginsburg set up a political fight over the future of the high court, with Republicans determined to seat her replacement before Election Day over Democrats' objections. If Donald Trump's nominee, Amy Coney Barrett, is confirmed, it would mean a profound change no matter who wins on Nov. 3: The court's 5-4 conservative majority before Ginsburg died would become a 6-3 supermajority. Here's a primer on the transition and what to expect from a new court.

● THE NOMINEE



Amy Coney Barrett could be the most conservative new justice to join the U.S. Supreme Court since Clarence Thomas, a dream addition for many Republicans.

Nominated on Sept. 26 by President Trump, Barrett champions the "originalist" approach that has become conservative orthodoxy for interpreting the text of the Constitution. She is an acolyte of the late Justice Antonin Scalia and a devout Catholic.

Should she win Senate confirmation to succeed Ginsburg, as expected, Barrett could bring about the biggest legal shift in decades—and at 48, she could serve on the high court for decades. Her vote would make the court

under Chief Justice John Roberts more likely to overturn Obamacare, disable federal regulatory agencies, and expand gun rights. She might even give conservatives their long-pursued goal of toppling the 1973 *Roe v. Wade* ruling.

Speaking in the White House Rose Garden after being introduced by Trump, she vowed to emulate Scalia, for whom she clerked in the court's 1998-99 term. "His judicial philosophy is mine, too," Barrett said. "A judge must apply the law as written. Judges are not policymakers, and they must be resolute in setting aside any policy views they might hold."

Barrett rates as more conservative than either of Trump's first two nominees, Neil Gorsuch and Brett Kavanaugh, according to a predictive scale developed by academic experts. Gorsuch and Kavanaugh have been generally reliable votes for conservative causes, though Gorsuch disappointed many backers in June with his majority opinion extending federal anti-discrimination law to LGBTQ workers.

Barrett has voiced skepticism about the Affordable Care Act, also known as Obamacare. In a 2017 law review article, she criticized Roberts's opinion upholding the law as pushing the text "beyond its plausible meaning." The Supreme Court will take up a new constitutional

challenge to the health-care law on Nov. 10.

Her record, says Adam Winkler, a UCLA School of Law professor, suggests she'd be even more supportive of gun rights than Scalia, who wrote the landmark 2008 decision that said the Second Amendment protects individual freedoms.

Barrett grew up in a New Orleans suburb and attended a Catholic girls' high school before graduating from Rhodes College and then Notre Dame Law School in 1997. She clerked for conservative Washington, D.C., federal appeals court judge Laurence Silberman before Scalia. She returned to Notre Dame as a professor in 2002 and taught there full time until Trump appointed her to the federal appeals court in Chicago in 2017. Barrett and her husband, Jesse Barrett, a federal prosecutor, have seven children, including two adopted from Haiti.

Religion plays a central role in Barrett's life. In a 2006 Notre Dame Law School commencement speech, she urged graduates to direct their legal careers toward "building the Kingdom of God." She has served as a trustee of a school run by a small Christian group called People of Praise that combines Catholic teachings with charismatic practices.

Barrett made her personal opposition to abortion clear in a 1998 law review article about Catholicism and judging. She wrote that abortion and euthanasia "take away innocent life" and that abortion is "always immoral."

But Jonathan Adler, a Case Western Reserve University law professor who is friendly with Barrett, says no one should assume she will vote to overturn *Roe*. "She thinks *Roe* was incorrectly decided as an original matter," Adler says. "But that's different from the question of whether or not it should be overturned." —*Greg Stohr and David Yaffe-Bellany, with Bill Allison, Perry Cooper, and Josh Wingrove*

● THE CONFIRMATION TIMELINE

Senate Republicans plan to start Barrett's confirmation process on Oct. 12. It will begin with hearings in the Judiciary Committee (where Democratic vice presidential nominee Kamala Harris is a member). A full Senate vote is tentatively planned for the week of Oct. 26, the week before the election.

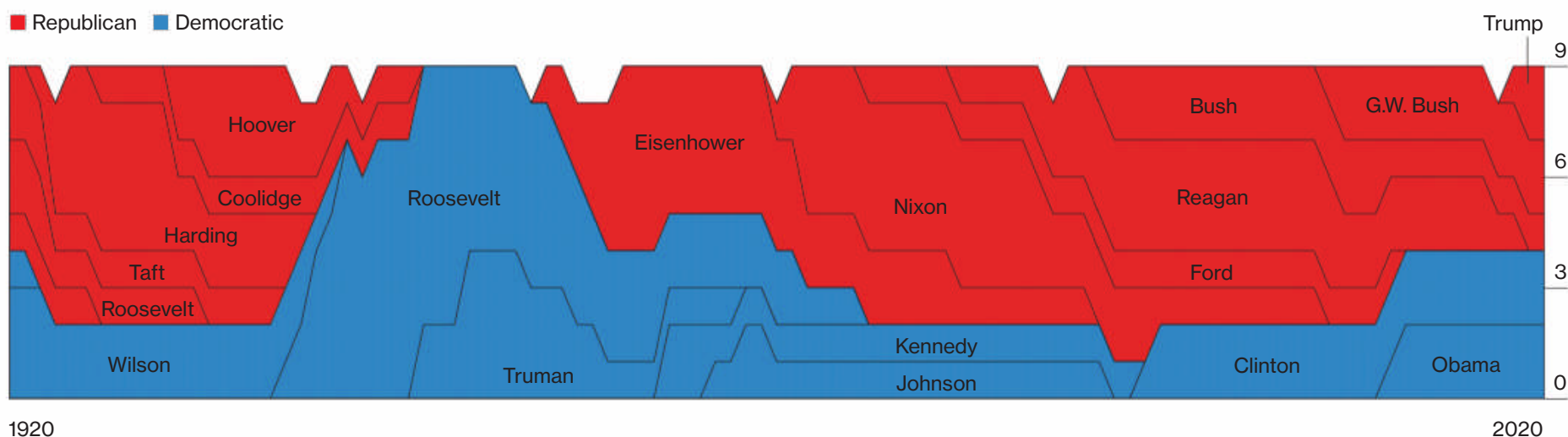
This timeline is unusually fast. Trump announced Barrett as his nominee on Sept. 26, less than 40 days before the Nov. 3 election. Only twice since 1975 has the chamber been able to confirm a Supreme Court pick in less time: In 1975, the late John Paul Stevens's confirmation took just 19 days, while former Justice Sandra Day O'Connor was confirmed 33 days after she was nominated in 1981.

The average period since 1975 from nomination to Senate vote is 69.6 days, according to a 2018 report from the Congressional Research Service. If the Senate moved at its typical pace, confirmation would come in late November or early December. The time between nomination and a confirmation vote has increased significantly since the early days of the nation. Back then, some justices—including one tapped by President George Washington—were confirmed on the same day they were nominated. —*Laura Davison*

● "When you have the Senate, when you have the votes, you can sort of do what you want as long as you have it."

President Trump on the show *Fox & Friends* on Sept. 21, responding to the suggestion that Republicans are hypocritical in fast-tracking Barrett's confirmation because they blocked President Obama's nominee Merrick Garland for eight months before the 2016 election.

● Composition of the nine-member Supreme Court by nominating president as of Jan. 1 of each calendar year



● WHAT A POST-GINSBURG COURT WILL MEAN FOR...

THE ELECTION RESULT

Ruth Bader Ginsburg's death could deprive Democratic presidential nominee Joe Biden of a crucial vote should the court be confronted with a dispute after the Nov. 3 election along the lines of the 2000 *Bush v. Gore* case.

The court's 5-4 decision then sealed the disputed presidential election for Republican George W. Bush. Ginsburg dissented, saying the court should have let Florida continue with a recount that might have shifted the state—and the presidency—to Democrat Al Gore.

The court has generally sided with Republicans in voting clashes in recent years, often with Chief Justice Roberts joining his conservative colleagues in 5-4 majorities. Even if nominee Amy Coney Barrett isn't confirmed in time, Ginsburg's absence could matter in an election case. A 4-4 split in any case would leave intact the lower court ruling, potentially one that favors Trump. —Greg Stohr

THE AFFORDABLE CARE ACT

The court is scheduled to hear arguments on the Affordable Care Act on Nov. 10. The Trump administration is urging the court to declare the law invalid, including its protections for people with preexisting conditions. Roberts joined the court's liberals in a 5-4 decision to uphold the core of the law in 2012, but the law's supporters will now have to secure a second conservative vote to win the case. A federal appeals court found part of the original 2010 law unconstitutional and left doubt about the rest of it.

The fight stems from a provision known as the individual mandate, which originally required people to acquire health insurance or pay a tax penalty. Roberts said in the 2012 case the provision was a legitimate use of Congress's taxing power. —Greg Stohr

ABORTION RIGHTS

The confirmation of Barrett would "monumentally change the direction of the court and turn back the advances in women's rights and civil rights that Justice Ginsburg devoted her entire career to," says Leah Litman, a constitutional law professor at the University of Michigan. "It is impossible to overstate how significant this could be."

Abortion rights were already in doubt even before Ginsburg's death. Although the court in June struck down a law that might have left Louisiana with only one clinic, the vote was 5-4, with Roberts suggesting in his pivotal opinion he might support other restrictions. The Louisiana law would have required doctors who perform abortions to get admitting privileges at a local hospital. —Greg Stohr

BUSINESS

The Roberts court has been good for business. With a third Trump appointee and a 6-3 conservative majority, it could be even better.

A 6-3 court would likely be more favorable for business on issues including arbitration and employment. It would also boost conservatives' quest against the so-called administrative state, shorthand for the tangle of regulations that Democrats see as protecting workers, the environment, and more, which Republicans see as unduly burdening free enterprise. Oil and gas drillers, utilities, management interests, and small businesses are among those who stand to gain.

"Significantly, in recent years, Justice Ginsburg was the justice most likely to reject corporate-backed positions in business cases and to vote instead in favor of workers, consumers, or the government," says Brian Frazelle, the appellate counsel of the progressive Constitutional Accountability Center.

The court "has been trending significantly in a pro-business direction, by enforcing arbitration and pushing more things into arbitration, including class actions," says Boies Schiller Flexner partner Scott Gant. He argued a debt collection case last term in which Ginsburg was the lone dissenter siding with the debtor. —Elliott T. Dube (*Bloomberg Law*)

● CHANGING ROLES ON THE BENCH

JOHN ROBERTS



Appointed in 2005 by President George W. Bush, Roberts has long fought the perception of the court as a political body, insisting that judges are akin to neutral baseball umpires and

pushing back against Trump when the president criticized an "Obama judge."

In recent years, Roberts sided with the liberal wing in a handful of major cases and resisted his conservative colleagues' calls to resolve more divisive issues, such as gun rights. But a new conservative justice would reduce Roberts's leverage, probably stripping him of his position as the swing justice in the bulk of the most polarizing cases. Roberts "will lose influence," says Case Western law professor Jonathan Adler. —Greg Stohr

BRETT KAVANAUGH



Justice Kavanaugh remains anathema to many liberals. But he may soon be their best hope to save abortion rights and Obamacare.

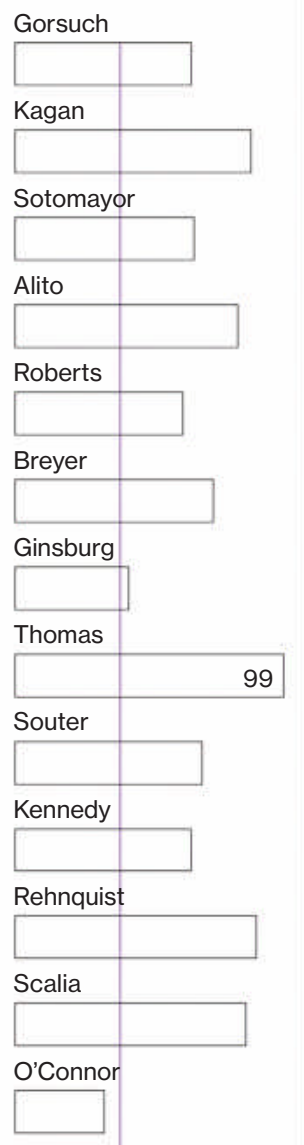
Kavanaugh, who prefers narrower rulings than some of his conservative colleagues, will find himself at the court's ideological center if Trump succeeds in replacing Ginsburg with Barrett. "Kavanaugh would by default become the most logical person to play the pivot role," says Carter Phillips, a lawyer at Sidley Austin who has argued 79 cases before the Supreme Court.

Kavanaugh is hardly an ideal choice for Democrats, even if they ignore the lingering raw feelings stemming from the sexual assault allegations that almost derailed his nomination in 2018, which Kavanaugh angrily denied. In his two terms on the court, he has backed religious freedoms, voted against LGBTQ workers, and sided with Trump on presidential powers and immigration issues. He's also supported property rights and the death penalty and voted to shield partisan gerrymanders from constitutional challenges. —Greg Stohr

▼ Supreme Court appointees, first term

Trump	●●●○
Obama	●●
G.W. Bush	-
Clinton	●●
Bush	●●
Reagan	●
Carter	-
Nixon	●●●●

▼ Number of days from nomination to final confirmation vote



38 days between Coney Barrett's nomination and the election

● CORNERED DEMOCRATS PIN THEIR HOPES ON THE BALLOT BOX

Democrats are aiming to avoid the vitriol that accompanied the hearings for Kavanaugh, President Trump's last court pick, by focusing on what they see as a winning election issue: the future of Obamacare. And with little chance to block or hold up Amy Coney Barrett's nomination, since Republicans are likely to get enough votes to confirm her, they are looking to Election Day.

"The clear focus is, this is about your health care. This is about whether or not the ACA will exist," Joe Biden told reporters in Delaware on Sept. 27. "This is about whether or not preexisting conditions will continue to be covered. This is about whether or not a woman can be charged more for the procedures [than] a man. This is about people's health care in the middle of a pandemic."

The Republicans' timetable would install Barrett on the court before the Nov. 3 election, putting her on the bench when the justices will review a federal appeals court decision that found part of the original 2010 Affordable Care Act unconstitutional. Trump's administration and several Republican-controlled states are urging the court to say that the law, including its protections for people with preexisting conditions, is invalid.

Warnings about Republican threats to Obamacare were central to the Democrats' campaign when the party netted more than 40 seats to win control of the House of Representatives in 2018. As the party eyes the presidency and a Senate majority in the middle of a pandemic, they believe health care will again be a winning issue. Biden leads Trump 54% to 40% with voters on the question of who is trusted more to deal with health-care issues, according to an ABC News/*Washington Post* poll of registered voters conducted the week of Sept. 20-27. The Democratic nominee is also more trusted to handle the coronavirus pandemic, leading 53% to 41% in the same poll.

Yet Democrats may be betting on an issue that has lost salience with voters as the economy has faltered due to Covid-19. The share of voters who say health care will be their deciding factor has dropped 16 percentage points since February, according to a poll published this month from the Kaiser Family Foundation. About 10% of voters say health care is the top issue for them in the presidential election, with about 32% citing the economy, according to the poll.

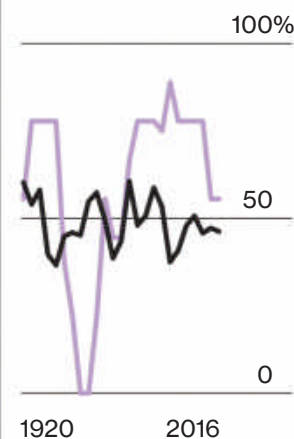
By homing in on health care, Democrats are casting aside other arguments that they might have focused on at a different moment, including Barrett's anti-abortion stance. Some Democrat-aligned groups are turning up the volume. The National Organization for Women called Barrett's nomination "dangerous and illegitimate" and said that Republicans are engaging in a "process that short-circuits democracy to guarantee a corrupt outcome." The progressive advocacy group Indivisible said Republicans were moving the country closer to a status "where women are forced to back alleys and dangerous home remedies to terminate a pregnancy." But House Majority Leader Nancy Pelosi said Barrett's stance on health care was more pressing than reproductive rights because of the case in front of the Supreme Court in November.

Democrats are coupling the health-care threat with a broader procedural complaint: that Trump and Senate Majority Leader Mitch McConnell have embarked on what would be one of the fastest justice confirmation processes in modern history, all as Americans are already casting votes to decide the presidency and control of the Senate. "Before Justice Ginsburg could be laid to rest, and after hundreds of thousands of Americans have already cast their ballots, the president nominated a successor to her seat," Biden said on Sept. 27. Suggesting the GOP is anticipating losses in November, Biden said, "they see an opportunity to overturn the Affordable Care Act on their way out the door."

Neither political attacks nor procedural hurdles are likely to compel McConnell to slow down. Democrats say they hope their unified argument will galvanize swing voters concerned about health care to vote against Trump and congressional Republicans. —*Jennifer Epstein and Laura Davison*

THE BOTTOM LINE A Supreme Court with Amy Coney Barrett could strike down Obamacare and more, but Democrats are seeking to avoid an all-out battle over her confirmation.

- ▼ Share comparison
- ✓ Republican share of the popular vote in presidential elections
- ✗ Share of sitting Supreme Court justices nominated by a Republican president



“
**Put bluntly,
this national
institution is
now, itself,
at risk of
extinction.**
”

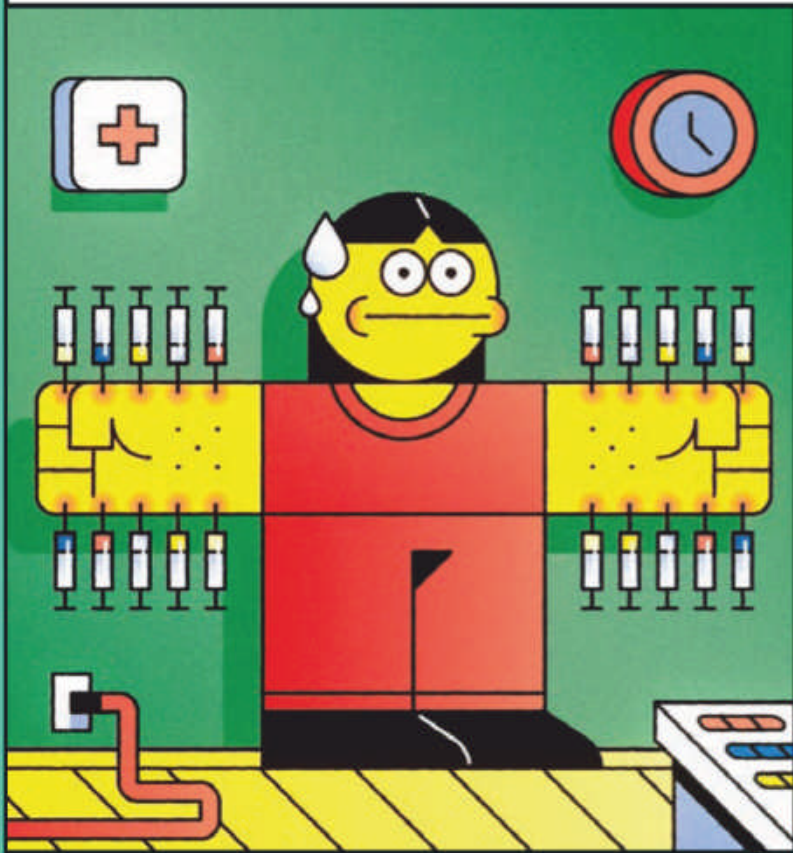
Sir David Attenborough

The Zoological Society of London has made an outstanding contribution to conservation for 200 years. But the sustained closure of London and Whipsnade Zoos has cut off vital income. Now, more than ever, we must support the work of this global conservation charity.

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Vaccines

Shots All Around



functional coronavirus vaccines—and some potential dilemmas. Please note that this is not medical advice. — *The Editors*

● PETER COY

New York ▷ Bloomberg Businessweek economics editor

Have we written anything on the possibility of a vaccine cocktail—i.e., could people get more protection by taking multiple vaccines? I guess this would depend on whether the vaccines respond to different targets or have different mechanisms of action.

You can see why it would be hard to test the safety and efficacy of a vaccine cocktail. Pharma companies don't have an incentive to cooperate by testing their vaccines jointly.

● JASON GALE

Melbourne ▷ Senior editor, Asia editing hub

It's going to be virtually impossible to test the safety and efficacy of vaccine cocktails in animals, let alone people. My understanding is that labs doing animal studies are overloaded already, and who's going to fund the research? Without proof-of-principle animal studies, it's hard to see cocktails being tested in people.

But it sort of makes sense. The vaccines in development use different approaches and often different bits of the spike protein. We know already that an initial priming shot seems to elicit a better response. ▶

A brief discussion about the implications of mixing and matching different Covid-19 vaccines

Journalism at Bloomberg News is a collaborative, cross-disciplinary, multi-time-zone endeavor where stories often begin with simple queries. An impromptu chat between a few reporters and editors recently imagined a hopefully not-so-distant future with multiple, safe,

◀ ● MICHELLE CORTEZ

Maple Grove, Minn. ▷ *Health-care Americas senior reporter*

There would be some scientific challenges since they would all be going after the same target. There are vaccine combinations, but the components neutralize different viruses (i.e., MMR for measles, mumps, rubella). I haven't heard of vaccine cocktails in the same way that we have drug cocktails, each hitting a different component of the same target. You would want to make sure they don't cancel each other out or—God forbid—overactivate the immune system.

● ROBERT LANGRETH

New York ▷ *Health-care Americas reporter*

What you are really asking about is an off-label mix and match of Vaccine A and Vaccine B—perhaps because the first one is all that's available, even though it's not that effective, and then another one comes along a few months later that's better. That actually came up on CNN recently, and Francis Collins, the director of the National Institutes of Health, said that's basically what happened with the shingles vaccine. There was one vaccine, then years later a better one came along, and everyone took both. I imagine there would be a shortage with the coronavirus, however, so you might get turned down if you already got one or might get put on a waiting list.

● MICHELLE CORTEZ

That's good to know. I'd been thinking you only got one chance, and do you just wait for the best? Also, that multiplies the size of the market.

● RILEY GRIFFIN

New York ▷ *Health-care Americas reporter*

How do you think pharma companies would articulate all that to the general public, Michelle? I'm imagining a scenario where, say, Pfizer and BioNTech bring a shot to market. A patient lines up to get it, even though it's only mildly efficacious. A few months later, another company, say Merck or Sanofi, brings forth a better option. Perhaps it's more effective, or maybe it's just more easily administered, like this "swish-and-swallow" oral vaccine Merck is working on. What's going to stop this patient from getting that one, too? How will governments keep track of all this? There's a lot of talk of Phase IV studies on Operation Warp Speed calls, where they'll monitor safety after shots are administered. But how do you know the average person, eager for protection, hasn't sought out another?

● MICHELLE CORTEZ

If the vaccines were administered only by your doctor, there might be some control, but since you'll practically be able to get it while you're at, say, the gas station, it's every person for themselves. What a weird world: Some people may get no vaccine, others potentially too much.



● RILEY GRIFFIN

Remember our colleague Max Abelson's story a few months back, "Rich and Powerful Jump to the Front of Line for Tests"? I don't doubt we're soon going to be writing that same story only about vaccines instead of tests. And this is going to become even more complicated when we have multiple shots, some more effective than others.

● STEPHANIE BAKER

London ▷ *European investigations reporter*

Robin Shattock at Imperial College London told me back in March he thought his mRNA vaccine may work as a booster to the University of Oxford vaccine to provide longer-lasting immunity, though I never heard Oxford mention that. I worry about unexpected side effects of mixing vaccines if taken within a short time period.

● ROBERT LANGRETH

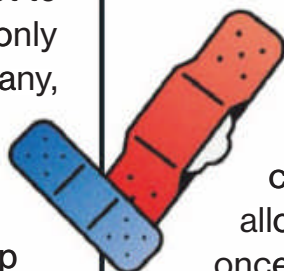
Mixing and matching two different vaccines, each with two doses, strikes me as crazy. But you can imagine some alternative-medicine doctor trying it. By the way, would insurance companies even cover multiple vaccinations?

● MICHELLE CORTEZ

Shouldn't be too expensive.

● ROBERT LANGRETH

But the insurance company could still say no and make you pay on your own. Or maybe, during a shortage like the one we anticipate, they'll implement a policy of one Covid-19 vaccine per person per year, like when they don't allow you to refill overlapping medicines more than once a month.



● JAMES PATON

London ▷ *Health-care Europe reporter*

One vaccine expert I spoke with worried that the arrival of the first vaccine, if it proved not very effective, would

disrupt trial enrollment for the next vaccine, which might provide better protection, because people would go for the new product and thus be ineligible for tests.

● ROBERT LANGRETH

That's actually a very big problem if they rush approval of a marginal but technically better-than-nothing shot. Doing so would make it much harder to test other vaccines that may be better and present a difficult problem.

● JAMES PATON

I've been talking to a couple of people about that, and I'm sure the companies just getting started with human tests are thinking about it.

● RILEY GRIFFIN

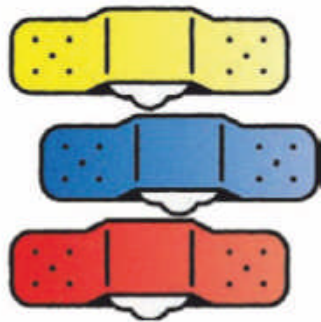
Merck's and Sanofi's R&D teams are adamant it won't affect them and that this world has enough people to test. I was pretty surprised when Sanofi's head vaccine guy, John Shiver, told me so bluntly: "That's all feasible if the pandemic continues in the way that it's been proceeding so far this year. I expect cases are going to accumulate later this year when our Phase III trial starts."

● JASON GALE

I spoke with an immunologist who says the hope is that once all the vaccines are on the market, this kind of mix-and-match research can be done as a Phase IV study—which he says isn't that difficult to do and could even be government-funded.

● MICHELLE CORTEZ

I connected with Wafaa El-Sadr, professor of epidemiology at Columbia and director of the Global Health Initiative at the Mailman School of Public Health. "You don't mix and match vaccines," she says. You need to get the immunization the way it was developed; if a vaccine requires two rounds, skipping the second means you may not reap the full benefit. She also says that having so many vaccines in a horse race is highly unusual and that safety issues may arise if people combine treatments: "Without studies of the novel combinations, there is no information on whether it will trigger side effects or decrease the effectiveness." In other words, as with all medication, take only as prescribed. **B**



'Crazy Fast' Science



The race for a Covid-19 vaccine has drug companies pushing their limits

On March 16, just two months after researchers deciphered the genetic code of the coronavirus that causes Covid-19, Moderna Inc.'s vaccine began human trials. Now, no less than four Covid vaccines are hurtling toward the finish line in the U.S. Moderna and Pfizer Inc., along with its German partner BioNTech SE, are leading the pack with vaccines that require two doses, while a single-shot vaccine from Johnson & Johnson began a late-phase trial last week. "This is beyond unprecedented," says Otto Yang, a viral immunologist at UCLA. "It is crazy fast."

There may never have been anything like this pedal-to-the-metal race in the history of vaccines. But will they work? And will enough people take them, especially amid the political turmoil surrounding their development?

Safety problems are unlikely, but not unheard of. In 1999 a new vaccine for rotavirus in infants was recalled after it caused cases of bowel obstruction that were missed in trials. And in 1976, after federal officials rushed out a mass vaccination campaign for swine flu, the program was shelved after about 1 in 100,000 people who got the shot developed Guillain-Barré syndrome, a rare neurological disorder.

Treatments that show promise could be brought to market quickly under so-called emergency use authorization, a lesser standard than full approval and one that's rarely used for vaccines. But that standard "is very loose," says Peter Doshi, a professor at the University ▶

◀ of Maryland School of Pharmacy. “We could easily have very little data.” Under an emergency authorization, vaccines would probably go first to health-care workers, first responders, or the elderly.

Not helping matters is President Donald Trump’s threat to override minimum requirements in order to get a vaccine to market even faster. Trust in the process is plummeting: Only 51% of American adults say they would likely get a Covid-19 vaccine, down from 72% in May, according to a Pew Research Center poll. “You can have the best vaccine in the world,” says Leana Wen, an emergency physician and public-health professor at George Washington University, “but if people aren’t taking it, it’s a failure.”

The big trials are aimed at preventing symptomatic cases of Covid. If they work, they should provide solid evidence that the shots are at least partially effective at preventing Covid-19 symptoms—at least in the short term.

Each trial relies on about 30,000 healthy volunteers or more. Half get placebos, while the other half get the vaccine. Tests continue until enough cases can be tallied to show the illness rate is reduced by at least half, the minimum Food and Drug Administration requirement.

But big drug and vaccine studies usually allow monitors to get an early peek at the data once or twice before the planned end. The panel can recommend stopping the trial early if a treatment is judged overwhelmingly effective—or, alternatively, a total dud.

Pfizer, which has the most aggressive plan, has given itself four preliminary looks at the data in a bid to quickly reach a conclusion in its 44,000-person trial. The first look could occur any day now, according to Airfinity Ltd., a London-based analytics firm tracking vaccine trials. Pfizer has said it expects conclusive results by the end of October; but it plans to continue the trial to obtain complete safety data. Outside experts say the approach is unusually bold.

Many public-health officials say the most important goal of a coronavirus vaccine is to prevent deaths, hospitalizations, and serious complications. But that isn’t the primary goal of most of these trials, which are focused first on reducing symptomatic cases. Pfizer’s trial, for instance, counts milder cases. According to

Airfinity, both Pfizer and Moderna won’t be in a position to determine whether their vaccines prevent hospitalizations until February.

That means doctors initially may have little information about how well the vaccines work at preventing serious illness, says Eric Topol, director of the Scripps Research Translational Institute, who has been critical of the way the trials were designed. “We want to know this vaccine has strong efficacy,” he says. “And that means two things: that it works in the majority of people and that it works to prevent serious infections, not sore throats or muscle aches.”

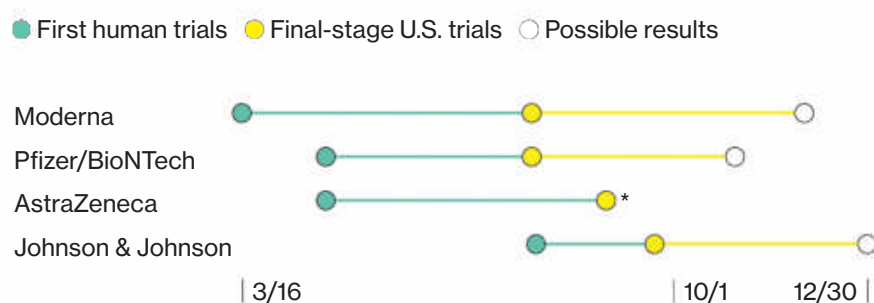
Pfizer’s trial was designed to evaluate its vaccine candidate “as fast as possible,” said Amy Rose, a spokeswoman, in an email. The company has worked with government scientists to develop best practices for testing and based its schedule for interim analyses on the vaccine’s “strong profile” in early human trials and animal tests, she said. Moderna’s trial was agreed upon with U.S. regulators, spokesman Ray Jordan said in an email. Johnson & Johnson’s trial, meanwhile, has stricter criteria for declaring early success, according to Airfinity. The company says it won’t seek approval before it has sufficient safety and efficacy data.

The Covid-19 vaccine trials are large enough to rule out relatively uncommon side effects, ones that may occur in 1 in 1,000 or 2,000 people. But they can’t rule out rare side effects that occur in, say, 1 in 20,000 people. Only long-term follow-ups once the vaccine is on the market can do that. Says University of Florida biostatistician Natalie Dean: “You really need impeccable safety.”

Some scientists are also worried a vaccine will be authorized before there’s time for adequate follow-up during the trial itself. The FDA would like drugmakers to provide at least two months of safety data, because that’s the time period after vaccination in which most serious complications occur. It’s this two-month proposal that Trump may be pushing back against in a bid to get authorization before the November election.

Durability of the vaccine is another critical unknown. And the quicker a vaccine is rushed out, the less researchers will understand its ability to provide lasting protection. “Durability by definition has to be studied over time, and there is not going to be enough time between now and the end of October to really know anything about durability,” says Tony Moody, an immunologist at the Duke Human Vaccine Institute. For other coronaviruses, such as the ones that cause the common cold, immunity tends to fade relatively quickly. For that reason, even if a Covid-19 vaccine works, people may need regular booster shots for years to come. —*Robert Langreth*

Nearing the Finish Line



THE BOTTOM LINE All vaccine development holds risk. But the unprecedented speed of the Covid-19 vaccine trials means no one can know for sure what future problems may arise.

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Caracas **The** Charlotte Chicago **global**
Copenhagen Denver Doha Dubai
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With the seasons changing and a vaccine a ways off, the U.S. needs to dramatically improve its infrastructure for rapid Covid testing. It's got options

By Drake Bennett and Michelle Fay Cortez Photographs by Sarah Anne Ward



WE CAN STILL PASS THIS TEST

As undergraduates returned to the University of Arizona for the fall semester, many of the new precautions were hard to miss. Plexiglass dividers were affixed in front of lecterns and between lab benches. Giant tents were set up so students arriving early for a class could wait outdoors, sheltered from the punishing sun. Roving teams of student “health ambassadors” tooled around in golf carts, handing out masks and politely chiding their peers for standing less than 6 feet apart.

But the first thing students had to do was visit one of the university gyms for a rapid SARS-CoV-2 test. The results took an hour. Negative, and you could move into your residence hall right away. Positive, and you were sent to a special isolation dorm, where you spent the next 10 days taking classes online.

Many of these safety measures emerged from discussions headed by Richard Carmona, a former U.S. surgeon general who’s a professor of public health at the university. Carmona’s medical career stretches back to the Vietnam War, where he served as a special forces medic after dropping out of high school. Over the years he’s developed an expertise in emergency preparedness and disaster response. As news of the novel coronavirus began making its way out of China last winter, the university’s president asked Carmona to form a working group and propose ways to keep the institution functioning during a pandemic. “The question was, what were the metrics we’re going to look at and how are we going to be able to make a reasonable determination that this is somewhat safe?” Carmona says. “We didn’t have a playbook for this. Nobody had a playbook.”

In early spring the team reached out to Ian Pepper, an environmental microbiologist on the faculty who had experience with wastewater testing. “It used to be called sewage surveillance,” says Pepper. “Now the preferred term seems to be wastewater-based epidemiology.” The technique traditionally has been used in population-level studies of illegal drug use or viral infections. Carmona’s team, however, wanted to go upstream from the treatment plant to determine not just if the coronavirus was on campus, but where. The sampling would provide an early warning system—people ill with Covid-19 can start shedding the virus in their stool as many as seven days before showing symptoms. “That gives you seven precious days for intervention,” Pepper says.

Over the summer, Carmona pored over university blueprints with the facilities department, tracing decades-old sewage pipes back to the dorms they drain, while Pepper worked on filtering samples and identifying trace amounts of the virus. By the time students returned in August, the program was in place. Each morning at 8:30—an hour chosen to give residents a chance to visit the bathroom—a faculty engineer working with an undergrad assistant would make the rounds, at each stop prying off a manhole cover and lowering an open Nalgene water bottle at the end of a long aluminum pole into the river of waste below. The pair would place the samples in a cooler and drive them back to the lab, where Pepper’s crew would turn around the results by the afternoon.

On Tuesday, Aug. 25, a week and a half after students started

to return, Pepper got his first positive, from the pipe leaving a dorm called Likins Hall. The next day, all 311 Likins residents took Covid tests. Two students, both without symptoms, came back positive and were relocated to the isolation dorm. Thanks to the head start, no other residents would contract the virus.

Since then, the university has stemmed outbreaks in at least eight other dorms using the same method. Pepper is scaling up his lab, training more teams of samplers, and expanding the effort to off-campus apartments and Greek houses. He’s fielding requests from around the world for help setting up similar programs. Carmona, for his part, is careful not to get ahead of himself. “It’s a tool that’s just evolving,” he says, “but we see value.”

Ever since the novel coronavirus began circulating in the U.S., the country’s response has been crippled by a failure to see the spread in anything close to real time. Half a year after the first wave of U.S. lockdowns, with more than 200,000 Americans dead from Covid, we’re still playing catch-up. The Trump administration’s botched rollout of its first tests, and the supply chain shortages that followed, helped the disease spread unchecked. Today, processing bottlenecks still render many test results worthless by the time people get them. This blindness has left public-health officials only the crudest measures of containment, such as broad social distancing mandates and lockdowns. It’s turned the loosening of restrictions on restaurants, sports, offices, gyms, and schools into terrifying leaps of faith. And it has surely killed people.

“The testing we are doing today is mostly just keeping score for the virus,” says William Hanage, an epidemiology professor at Harvard. Even that grim framing gives the U.S. system too much credit. The Centers for Disease Control and Prevention’s sampling of Americans with SARS-CoV-2 antibodies shows that the true number of infections is as many as seven times higher than the official count.

Over time, though, the problem of testing has attracted new focus, new thinking, and new money. Experimental viral screening technologies have taken big steps forward, and researchers have found ways to retool existing procedures. Some of that work isn’t likely to pay off in time to change the course of the pandemic, but some of it already has. And the outbreak’s global scale has spurred epidemiologists and policymakers to seek better answers to fundamental questions about the management of a modern plague: not only how to test but whom to test, and why.

Those debates are particularly vital now. The number of new U.S. Covid cases, which peaked this summer before dropping significantly, is climbing again—the CDC’s seven-day moving average rose from 34,371 on Sept. 12 to 44,307 on Sept. 26. Colder weather and classroom reopenings threaten an explosion of cases at a time when the public has tired of social distancing’s heavy costs. And we’re still, at the earliest, months away from a working, widely available vaccine.

Until then, testing can help close the gap between normalcy and where we are. If Americans want to safely send kids to school, eat in a cafe, go to a basketball game, or get on a plane, the U.S. needs to test a lot more people a lot faster. Faster,

cheaper testing may not flag every new case of Covid, but that shouldn't mean settling for the current level of blindness, with its torturous drip of preventable deaths. Even world-class testing won't rid us of the virus, but it can allow us to live our lives in the meanwhile.

Well before this year, the U.S. had ample warning about the health-care system's vulnerability to a pandemic. An industry long kept as lean as possible lacked the personnel and hospital beds needed to respond to a national crisis, let alone the protective gear and ventilators the coronavirus requires. Testing was the one thing the U.S. had supposedly handled. The CDC's early warning system for epidemics, based on reports from medical professionals all over the country, was designed to spot new diseases in time to head off bigger problems. And the technology to create tests for new viral diseases is so straightforward that it can generally be done in a few days.

When the time came, though, the apparatus worked against itself. After its Chinese counterparts published SARS-CoV-2's genetic sequence on Jan. 11, the CDC did indeed create its own test in a matter of days—but because of regulatory requirements and limited access to the relevant viral samples, the agency's Atlanta headquarters was the only place it could be done. In early February, the CDC produced tests that state labs around the country could use, but they were faulty and returned inconclusive results. Public and private clinical labs rushed to fill the void, only to be stymied by the Food and Drug Administration, which demanded extensive data and a regulatory submission before authorizing alternatives.

By early March, the U.S. was struggling to run 1,000 tests a day, while South Korea, which confirmed its first case the same day the U.S. did, was running 10,000. By the end of that month, lab giants Abbott Labs, Hologic, LabCorp, Quest Diagnostics, and Roche had rolled out U.S. tests of their own. But at \$100 to \$150 apiece, they were expensive, and labs were short on technicians trained to run them. Long, complex supply chains led to further shortages, from the swabs needed to gather nasopharyngeal samples to the reagents used to process the tests.

The tests in use at the time were molecular diagnostics known as polymerase chain reaction tests. Performed by medical professionals and processed in specialized labs, PCR tests identify segments of a virus's genetic material in secretions swabbed from the back of a patient's throat or nose. The

process starts with enzymes being added to the sample, which is then repeatedly heated and cooled to create billions of copies of the viral genome. Special "probe" molecules bind to the copied genetic material, releasing fluorescing nanoparticles whose glow signals the virus's presence.

Used in everything from food safety to DNA profiling, PCR tests take several hours and are extremely sensitive; if the virus is present in a sample, even in infinitesimal amounts, PCR will find it. To public health officials in the early days of the pandemic, reliability seemed like the most important quality. But the hospitals, doctors' offices, and pop-up testing facilities where PCR tests are given often don't have the equipment to process the results on-site—the thermocycler that incubates the samples costs at least \$100,000—so the swabs are usually sent out. That's resulted in massive backlogs and severely limited the tests' usefulness.

There are alternatives. One, a lateral-flow test, is a disposable strip of cellulose or woven fiber—picture a home pregnancy test. Instead of looking for viral DNA or RNA, it identifies proteins called antigens that protrude from the virus capsule. It exploits the lock-and-key relationship between those molecules and the antibodies the human immune system makes to identify them.

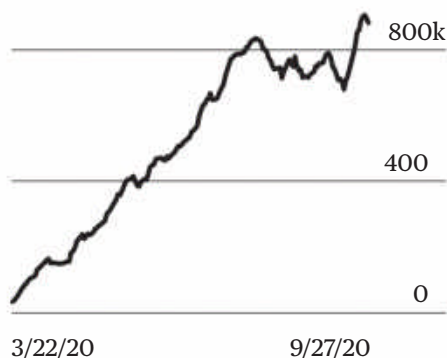
Lateral-flow tests can be done on nasal swabs, but some are in development to work with saliva. The sample is deposited at one end, doused with liquid, and then spreads through the fiber by capillary action, like a spill infusing a sponge. As it advances, the solution flows over antibodies embedded in the fiber with nanoparticles of gold or dye grafted onto them as tags. If the virus is present in the sample, the antibodies latch on and are carried along until the virus-antibody pair encounters a second set of antibodies anchored in a line. Those, too, grab onto the target viruses, activating the tags on the antibodies that hitched a ride earlier. As more virus-rich liquid reaches the line, the tags, like millions of microscopic pixels, form the telltale stripe of a positive result. The whole process can take as little as 15 minutes.

OraSure Technologies Inc. has long sold lateral-flow tests for hepatitis C and HIV. In 2017 it created the only FDA-approved Ebola antigen test. The company is based in Bethlehem, Pa., but sells many of its fast, cheap, over-the-counter diagnostics in sub-Saharan African nations that lack the medical infrastructure for PCR testing. At the beginning of this year, with the U.S. struggling to create reliable tests and its most advanced labs overwhelmed, Chief Executive Officer Stephen Tang saw the parallels.

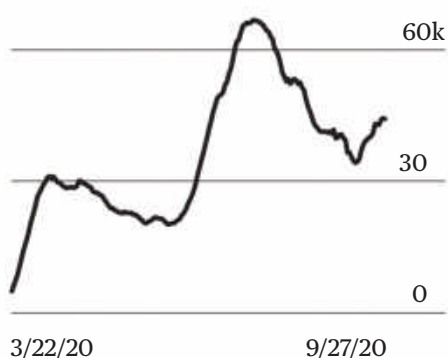
"We have to repatriate our experience from low- and middle-income countries," he says. "You have a test that is rapid, that you can take by yourself, that doesn't require an instrument to read or a medical professional to administer. What we have learned from experience is that people will test themselves more frequently in the privacy of their own homes." Tang plans to build on the company's HIV test platform to bring an at-home Covid test to market before the end of the year. While the HIV test costs \$40 to \$50 in a U.S. pharmacy, the company promises its coronavirus test will be cheaper. ▶

A FRESH SURGE FOR FALL

Daily Covid-19 tests in the U.S., seven-day rolling average



New daily Covid-19 cases in the U.S., seven-day rolling average



Other strip-test makers have also prioritized the pandemic. E25Bio, a startup born in an MIT lab two years ago, has temporarily shifted its focus from epidemic fever viruses such as dengue and Zika. “With Covid, there have been maybe 50 million infections worldwide,” says CEO Bobby Brooke Herrera. “Dengue causes 400 million every single year.” Like Tang, Herrera has been trying to apply lessons from countries with threadbare public-health systems to those like the U.S. He’s in discussions with U.S. regulators to authorize a coronavirus strip test made to be processed in a lab. Once it reaches the market, he says, a home version will be next.

Established testing companies are already bringing lateral-flow tests to market. On Aug. 26, Abbott Laboratories announced that the FDA had awarded it an emergency use authorization for BinaxNOW, a 15-minute disposable antigen test priced at \$5. A so-called point-of-care test, it must be given by a health professional. But since it requires no lab equipment, an unlimited number can be conducted and processed at any given time. Abbott is already producing 50 million of them a month.

A test’s accuracy is a matter of sensitivity (how often it correctly spots a disease) and specificity (how often it correctly rules the disease out). A test with low sensitivity will miss lots of cases; a test with low specificity will mistakenly tell people they have a disease when they don’t. Lateral-flow tests are neither as sensitive nor as specific as PCR tests. They’re more likely to miss an infection during the incubation period, as the invader has just started replicating, or weeks in, when the body’s immune response has managed to eliminate many of the virus particles.

Lateral-flow tests’ lower sensitivity has hampered efforts to bring them to market. There are concerns that tests done at home, where people swab their own noses instead of having a professional do it (or at least supervise), could further lessen the sensitivity. Herrera says he doubts E25Bio’s at-home test will be approved without a change in expectations from the FDA, which requires accuracy levels difficult for him to achieve outside a lab. (OraSure says it’s confident it can clear the bar.)

Some companies are trying to address this shortcoming technologically. Mammoth Biosciences Inc., working with a microbiologist named Charles Chiu at the University of California at San Francisco, is using the DNA-splicing technology Crispr to improve the accuracy of strip tests. Crispr’s potential for precise gene editing rests on its use of sequences of “guide” RNA that zero in on target genes. Chiu and Mammoth are turning that search-engine property to the task of finding the telltale genome of SARS-CoV-2.

The effort is taking two parallel paths. One that the FDA cleared this summer runs on the same equipment as PCR tests, but it copies the viral genetic material without the time-consuming heating cycles. The other, in development with GlaxoSmithKline Plc, manages to replicate this approach, with the attendant sensitivity, in a self-contained and disposable kit not unlike a lateral-flow test. “You’re getting the

same accuracy as in the lab, but it’s much easier to use,” says CEO Trevor Martin.

Another school of thought, though, holds that worries about the sensitivity of strip tests miss the point. “The way we’ve been approaching testing so far in this epidemic is to try to shove a public-health need through a diagnostic pathway,” says Michael Mina, the Harvard epidemiologist who is the leading proponent of this idea. Mina argues that we should essentially test everyone all the time, everywhere. It’s a form of what public-health experts call surveillance—rather than diagnostic—testing. In this model, speed and ubiquity are all that matter.

Mina likes to talk about what would happen if we had \$1 self-administered saliva tests. Restaurants and bars would have cups of strips on the maître d’ stand by the toothpicks and the mints. Theaters would have them at the door. Air travelers would be tested at their departure gate before boarding. (The International Air Transport Association recently announced its determination to put a system like this in place.) Coronavirus testing would become a habit—if not like brushing our teeth, then at least like flossing. These tests would be much more reliable than temperature checks, which can miss carriers with mild or nonexistent symptoms.

At a large enough scale and a high enough frequency, the thinking goes, testing is all you need to do. Tests at the entrance to offices and schools would visibly ensure the safety of those spaces, encouraging people to return to them. People who test positive could immediately isolate themselves, breaking the chain of transmission. In this world, a strip test’s relative insensitivity would be less of an issue—positives could be double-checked to make sure they’re correct, and false negatives would be caught a day or two later by the next test, still early in the disease course. Mina goes so far as to characterize lower sensitivity as an asset, because a PCR test taken in the late stages of Covid-19 will still show positive even if the patient is well past the contagious stage and no longer needs to be isolated. In that sense, he argues, strip tests can better gauge an individual’s risks to the broader population.

“I don’t want to see these kinds of tests being promoted as passports to party or to go out to dinner—that misses the big picture,” the epidemiologist says. “These aren’t passports. These are actually the intervention, like a vaccine, to suppress population spread.” According to his modeling, testing just half the population every three days would bring Covid under control within weeks.

To make this a reality, the FDA would need to relax its testing standards down from PCR-level sensitivity, and someone would need to manufacture and pay for the untold billions of tests. Mina believes it should be Congress. “This is a national emergency,” he says, and a \$50 billion or \$100 billion price tag to stop the virus is easily worth it given that the U.S. has already spent \$3 trillion in Covid-related stimulus money and its economy has lost trillions more.

At least one of the two men running for president has unequivocally committed to more testing. The first point in Joe Biden’s seven-point Covid plan is to “ensure all Americans

“WE HAVE TO MAKE DECISIONS. IF WE DON’T HAVE TENS OF MILLIONS OF TESTS A DAY—AND WE DON’T—WHO DO WE WANT TO LEAVE OUT?”

have access to regular, reliable, and free testing.” The plan mentions at-home and instant tests and proposes a testing board modeled on Franklin D. Roosevelt’s War Production Board, which oversaw the manufacture of weapons and supplies that helped win World War II.

President Trump has publicly called for less testing, and his CDC recently said asymptomatic people who’ve had contact with a sick person don’t need to be tested. (Most public-health experts strongly disagree, and the agency has since reversed that guidance.) On the other hand, the day after Abbott unveiled its lateral-flow kits, the U.S. Department of Health and Human Services announced a deal to buy and deploy 150 million of them. And the agency is already distributing a different type of antigen test to nursing homes across the country. Of course, all of this is a fraction of what Mina’s plan would require.

Among his fellow epidemiologists and public-health experts, Mina’s plan does have skeptics. Without reimbursement, the price of even very cheap tests might be a challenge for some families and organizations. (New York City’s school system has more than 1 million students.) The production of billions of new tests could create supply chain problems of its own, and the millions of false positives and negatives that would be produced at that scale could further undermine Americans’ shaky confidence in their public-health system, a dangerous prospect in a country where large numbers already refuse to wear masks. There’s also no mechanism to compel people who test positive at home to stay there, especially if they’re living paycheck to paycheck without paid sick leave.

It’s our failure to act on the test results we have that has been the problem, these skeptics argue. As Hanage, Mina’s colleague at Harvard, points out, South Korea succeeded in corralling the virus by relentlessly tracking down those put at risk by each discovered case, not by reinventing testing. “All of these extraordinarily smart people are coming up with extraordinarily smart things,” Hanage says, “and we haven’t done the basic things right.”

Whether or not Mina can sell the idea of regular tests for all, the importance of faster, more widespread surveillance testing has become clear. Such a model could use strip tests, if they can be scaled up, or it could rely on methods such as pooling—combining multiple samples to increase the throughput of labs. Hanage is particularly excited about the potential of wastewater.

Ashish Jha, a physician and the dean of the Brown University School of Public Health, is among the scholars who’ve tried to calculate how many tests the country actually needs. Early in the pandemic, his team came up with a range of 500,000 to 600,000 per day. Those estimates, though, assumed that positive results would be followed by South Korea-style contact tracing. So far, such programs have largely

failed in the U.S., and Jha is reassessing. “I have increasingly come to believe that a large army of contact tracers may not work in our country,” he says. “And that we’ll need large-scale surveillance testing as a strategy for building a high degree of safety into a lot of our activities.”

Jha’s new approach focuses less on how many tests the nation needs than on where they’re needed. Nursing homes and hospitals are places where people should be tested all the time, he argues, with meatpacking plants, prisons, and schools close behind. “You could make the case for any place where you can get large numbers of people gathering indoors for extended periods,” he says. “My argument has been that we have to make decisions. If we don’t have tens of millions of tests a day—and we don’t—who do we want to leave out?”

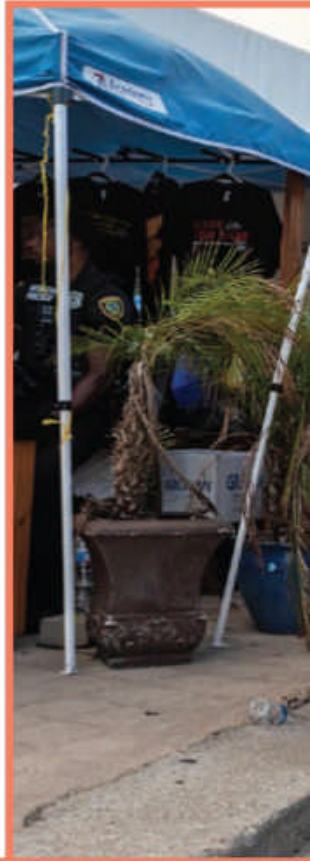
The American health-care system, with its balkanized tangle of private and public providers, consumers, and often-reluctant reimbursers, is structurally resistant to nationwide interventions. “With a few exceptions, we don’t have a national or even a statewide public-health infrastructure that scales to administering many, many procedures directly to patients,” says Katherine Hempstead, a health-care policy adviser at the Robert Wood Johnson Foundation.

It’s possible that an imagined Pandemic Testing Board on a war footing could overcome some of those limitations. If not, and at least until then, it’s likely that the U.S. will see the uneven growth of the patchwork testing quilt we already have. Individual companies, schools, even states could put together effective testing programs while other efforts fail. In August, a group of governors announced a joint effort with the Rockefeller Foundation to purchase millions of antigen tests.

The patchwork model means gaps, blind spots, and inequity. But it will nonetheless embed the idea of disease surveillance in our lives long after this pandemic is over. One of the problems that’s bedeviled the U.S. response at every level is the nation’s short attention span. Public and private funding goes to swine flu or Zika or Ebola, then evaporates once the immediate danger has passed. “It’s shortsighted, the fact that we only deal with the outbreak of the day,” says UCSF’s Chiu. “Had we had ongoing funding to do diagnostics for Zika, maybe the tests that we’re now struggling to develop in real time would have already been developed.”

Even the terrible costs of Covid probably won’t curb these human tendencies, but more durable changes might help. In Arizona, Carmona has been meeting with architects trying to figure out how to design buildings with wastewater epidemiology in mind. One of their goals is to enable future sewage samplers to trace pathogens not just to a building but to individual floors, or even rooms. “It may be what we’re going to need in the future,” Carmona says. “We probably will have other biologic hazards—maybe not a pandemic, but it could be an epidemic, or just an outbreak—where you’d like to know where the sick people are.” **B**

HARD SUMMER IN H-TOWN



Houstonians know all about disasters. We saw what happened in New York. But when the pandemic came, we did what much of America did: Ignore it until it's too late

By Shannon Sims
Photographs by Michael Starghill



It's Friday night in Houston: 9:30, 102F, 90% humidity, and the patio at Flava Restaurant & Bar is packed. Friends are sucking on hookahs. Waitresses hustle by in booty shorts. Someone climbs on a picnic table to twerk.

The place looks over capacity. Owner Louis Watson knows it. Houston Covid Task Force Chief Keith Kennedy knows it. And judging from the expression on his face when Kennedy rolls down his tinted window, the valet knows it, too.

In the rearview mirror, I watch the valet hustle over to the bouncer, who calls Watson over from his perch on a railing beside the DJ. By the time Kennedy, who's also the chief arson investigator for the Houston Fire Department, has parked and made his way to the entrance, Watson is outside with a light blue folder spread open on the hood of a matte black Jeep Wrangler.

When the pandemic started, Watson was a young Black businessman coming into his own, with a corner property on the Richmond Strip, not far from the moneyed Galleria Area and near Polekatz and La Bare, two of Houston's better-known strip clubs. His main concern now is no longer just beating the competition—it's also avoiding being shut down or fined into extinction by the tangle of rules officials have deemed necessary to keep Houstonians from dying of Covid-19.

"I am abiding by all state, county, and city regulations," Watson says before Kennedy can get in a word. "And my adherence to those rules is in compliance with the governor's executive order GA-28, which reads here as follows: 'Every business establishment in Texas shall operate at no more than 50 percent of the total listed occupancy of the establishment.'"

Kennedy hooks his thumbs on his belt, looking amused.

"So here under Section 12: 'People should not be in groups larger than ten and should maintain six feet of social distancing from those not in their group.'" Watson waves a finger in the air. "Except! Do you see here how it says, 'Except?'" The word "except" has been conveniently highlighted in yellow. "So then we turn to the exception," he says, flipping a page.

Watson sweeps his hand to indicate the patio and argues that, because fewer than 100 people are there, it can be over half full. Kennedy lets Watson finish making his case, then issues a verbal warning and promises to return next weekend. "Our job is to enforce," Kennedy says later. "But we're gonna shut down businesses? We're gonna make citations when people are hurting?"

The first big sign that the pandemic had arrived in this city of 2.3 million was quintessentially Texan: The world's biggest rodeo was canceled. Specifically the Houston Livestock Show and Rodeo, an annual extravaganza that kicks off with a freeway horseback ride into town and spans 28 days of mutton-busting, barbecue contests, and 75,000-strong crowds. The festivities were well under way, with my goat-skin boots all polished up for the party, and Willie Nelson and Lizzo were days away from performing, when Mayor Sylvester Turner declared a public-health emergency and announced that all city-sponsored events would be suspended. It was March 11, and there were 14 reported local cases. ►

▼ The Covid Task Force makes its rounds

◀ Many people thought Turner was overreacting, but in retrospect we were kidding ourselves. It's not as if we didn't see what was happening in New York or five hours away in New Orleans, which had suddenly become an epicenter. Signs on the freeway told us "Personal travel from Louisiana must quarantine," and still, for some reason, we thought the pandemic wouldn't really touch us.

Then came reports, in late May, that intensive care units were nearing capacity. But that, too, seemed implausible in a town rife with world-class medical facilities. Businesses closed, then tried to reopen, then reclosed. By July 4, there were 566 deaths. On July 31, 1,664. It turned out there'd been more cases in our city than we knew: A *Houston Chronicle* investigation later showed that at least three dozen people who were symptomatic before the first reported Covid-19 case later tested positive. Three of them died.

I'm from Houston, but I was supposed to be back only briefly this spring before returning to Brazil, where I've lived and worked for much of the past decade. Instead, with my return on hold, I found myself spending months wandering an uncannily quiet, traffic-less city. As the bad news mounted, I saw Houston fumble to grasp the gravity of the situation. With temperatures rising high enough that the air above the asphalt wobbled, Houston slipped into a delusional state, a kind of public-health fever dream. We'd pack restaurant patios in the shadow of filled hospital skyscrapers, complaining about business closures as ambulances screamed through empty streets. Houston never quite got a handle on the pandemic; like much of the country we just assumed things would improve as time ticked by.

I witnessed it play out the way any good Houstonian would: by hitting the freeway. The city's rings of highways, 38, 88, and 170 miles around, are crosscut by even wider interstates, one of them 26 lanes across, the widest in the world. Any given exit will deliver you to a different shade of Houston; these days it will also bring you to a different shade of Covid.

My first stop is just inside the southern curve of the Inner Loop. Down the block from Rice University lies Ben Taub Hospital, a 444-bed Level 1 trauma center, one of the country's busiest, with an ER that handles 80,000 patients a year. Many of those who come in are uninsured, as 17.7% of Texans are, the highest share of any state.

The hospital has been at capacity since early March, when Esmaeil Porsa came on as president and chief executive officer of the Harris Health System, a job that includes managing Ben Taub and its sister facility, Lyndon B. Johnson Hospital. Porsa was almost immediately overwhelmed. "Early on, one of the things I noticed was that Ben Taub and LBJ were taking care of a much higher proportion of Covid patients compared to the rest of the hospitals," he says when we speak in August. "These are safety-net hospitals, and the indigent, underinsured, and racial minorities also happen to be the segment of the population that is most impacted by Covid."

In April and May, Houston saw 200 to 400 new cases a day. By mid-June the number was up to 2,000. So many Ben Taub employees caught the virus that the Harris Health System transferred in an extra 200 nurses to fill the breach. The hospital transformed the ER from an open bay to a maze of plexiglass and plastic sheets designed to create negative pressure zones, which allow outside air in while preventing potentially contaminated inside air from escaping. "I can tell my staff are worn out and having anxiety wondering if they're going to become infected or bring it home," Porsa says. "When I see nurses with Band-Aids on the bridge of their nose"—from prolonged mask-wearing—"that's not normal."

Under ordinary circumstances Ben Taub could transfer its overflow patients to other hospitals, but that soon became challenging. Even the parts of the gargantuan 9,200-bed Texas Medical Center that could handle Covid cases were filling up. "That was a really uncomfortable situation," Porsa says. "You had patients



▼ Walle, the state representative, outside Sunny Flea Market



in the ER waiting for a bed for over 24 hours.”

As case numbers mounted, he got scared. “People are just lined up in the ER, and you hear horror stories,” Porsa recalls. He trails off, looking distressed,

before regaining his composure. “You can’t plan for that.”

Another stop, on a gusty Saturday, is the Sunny Flea Market, located in a poor part of Houston’s north side that became a virus hot spot. The market is near a busy intersection bounded by used-car dealerships, a Family Dollar, and the Cathedral of Saint Matthew.

I find Armando Walle, a 42-year-old Democratic state representative, standing near the entrance to a warren of stalls, beside a woman selling Mexican candies from a cart. He’s trying to hand out masks from a big reusable shopping bag jammed full of boxes. Everyone is rushing inside, looking to escape the threatening tropical storm cloud billowing up above us. Their faces are almost all covered, unlike the revelers’ at Flava, with even the kids wearing mini-masks. Undaunted, Walle heads inside, past plates of sizzling pork rinds and rows of python-skin cowboy boots. The shoppers look to be about 98% masked up. He finally finds one target looking for grilled corn, another trailing a pack of hyper grandchildren, and another none-too-discreetly hissing “*micas micas micas*”—slang for IDs that allow border crossing—as we pass by.

Walle grew up in his district, which is 83% Hispanic. More than half of its population doesn’t have a high school diploma; about a quarter works in construction. It has one of the lowest voter turnouts in the state, according to Walle. After 12 years in office, he’s running unopposed for reelection in November. He says most of his constituents work service jobs and live paycheck to paycheck, and so were unable to stay home during the worst of the outbreak. “Either you put food on the table or you don’t, so someone is risking their life,” he says.

In April, Walle was named Covid relief and recovery czar by the county judge, Lina Hidalgo. “We live in Houston, Texas, with the world-renowned Texas Medical Center,” he later tells me. “And you can go 2 or 3 miles in each direction of the Med Center and find ZIP codes where people can’t see a doctor because they make too much for Medicaid and too little to afford private health insurance.” Those are the families he says he’s trying to fight for. “This pandemic has put a huge spotlight on Texas’ inability to respond.”

Ironically, perhaps no one has been more frustrated by the response than the person responsible for it in Harris County: Hidalgo, the county judge. When I meet her at her downtown office on yet another scorching weekday afternoon, I see why she’s often likened to Representative Alexandria Ocasio-Cortez. Like AOC, Hidalgo is a twenty-something Latina first-termer; she’s also stirred up similar passions among supporters and critics. Several times during my rounds of Houston, I’ve heard people trash her. Usually it’s just grumbling—who-does-she-think-she-is kind of stuff. A right-wing retired oil executive calls her a “storm trooper.” A woman at my doctor’s office calls her a “loon.” Others say she doesn’t know what she’s doing, that she’s out to get local businesses, that she’s a puppet for the national Democratic Party.

A beneficial side effect of her high profile is that almost every Houstonian now knows what a county judge is and what she does. Harris County is governed by four elected county commissioners and the county judge, an elected, non-judicial position. The judge presides over the commissioners’ court and is the de facto chief financial officer of the county’s \$4 billion budget. She oversees, among other things, tax rates, bond elections, county jails, and storm preparation. She’s also the county’s crisis director, as head of the Harris County Office of Homeland Security and Emergency Management.

Hidalgo arrived in Houston from Bogotá when she was 15. After graduating from Stanford, she worked as an interpreter at the Texas Med Center, then got a joint degree in law and public policy from New York University and Harvard. She was motivated to enter politics by Donald Trump’s election in 2016. She had no experience, but after Hurricane Harvey hit the following year, displacing more than 30,000 people, many voters started rethinking who they wanted in charge of emergency management. That helped Hidalgo pull off an upset in 2018, when she defeated longtime Republican incumbent Ed Emmett by 1.6% of the vote. She’s now a rising star nationally, appearing on the cover of *Time* and in a video at the 2020 Democratic National Convention.

Sitting in her office, dressed in a blazer, with her face framed by dark curls, Hidalgo is almost unnervingly soft-spoken, even when discussing heated topics. “I know what we need to do here, but my authority has been stripped away,” she says, spacing out her words with pensive pauses. Her job as emergency manager, she asserts, has been fundamentally undermined by the governor.

When Governor Greg Abbott issued a stay-at-home order on March 31, he and Hidalgo were in accord. “In the beginning ►

► **Hidalgo, the county judge, and Porsa, the county health system executive**

◀ we were working together. We were all putting out a fire,” she says. “When the mask order was issued, that’s when it started getting political.” She’s referring to a directive requiring Harris County residents to cover up in public that she signed on April 22, prompting the ire of some of Abbott’s fellow Texas Republicans. Lieutenant Governor Dan Patrick called the move “the ultimate government overreach,” and U.S. Representative Dan Crenshaw warned of encroaching “tyranny.”

Five days later, Abbott, who didn’t respond to interview requests for this story, barred cities from levying penalties to enforce mask orders. He also said that his stay-at-home order would expire at the end of the month and announced that a phased economic reopening would begin as soon as May 18. Abbott concluded his prepared remarks with a phrase that would return to haunt him as the crisis wore on: “We are Texans. We got this.”

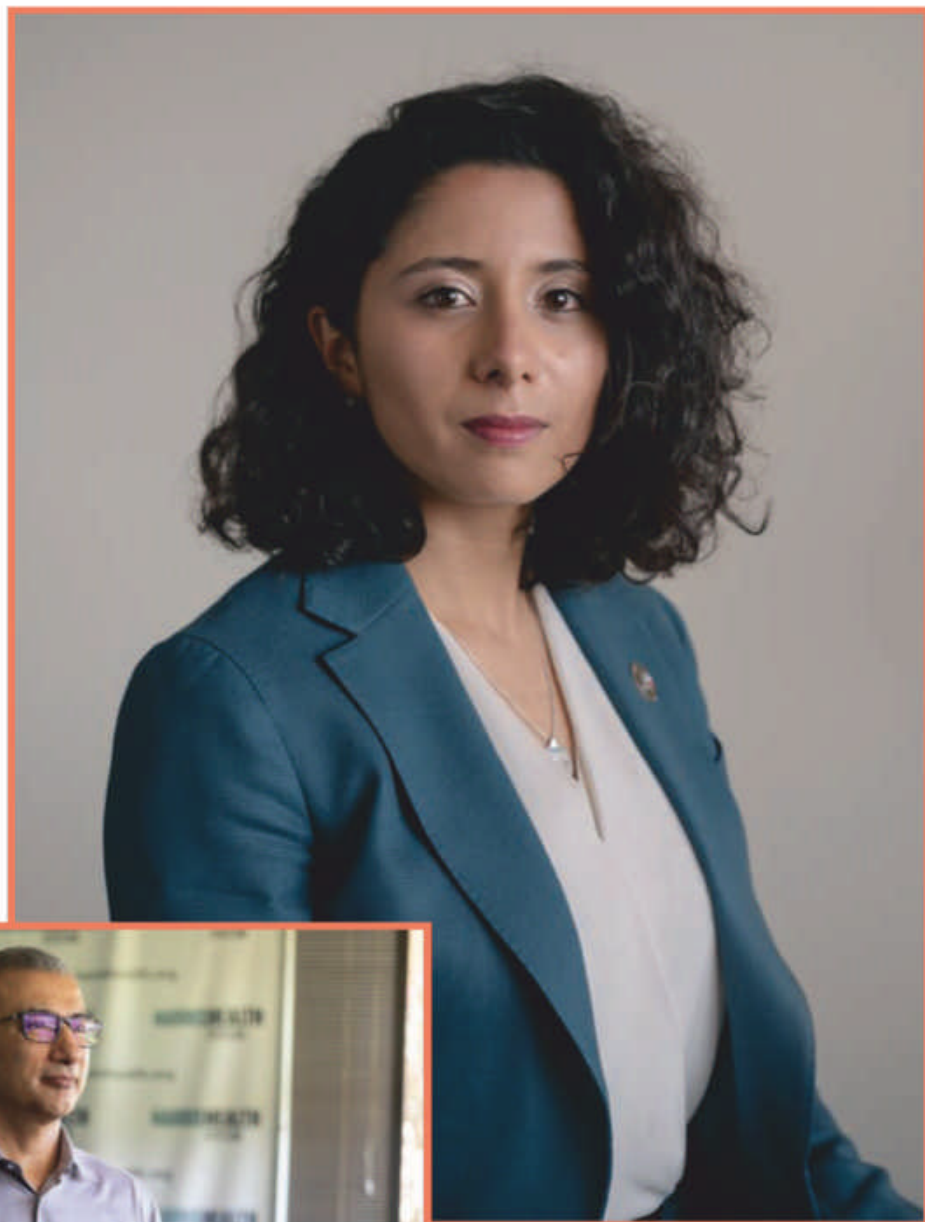
With Abbott’s stay-at-home order set to expire, Hidalgo issued one of her own on May 2. The governor overruled her, saying she lacked the authority. When she tried to issue another one as cases surged in late June, he again said the authority was his and he wouldn’t be exercising it. The best Hidalgo could do was to send an emergency cellphone notification telling citizens the region was in “red alert” and everyone should stay home. After that, anytime she wanted to do something, “it was ‘Pretty please,’” she says, stretching out her palms as though begging.

Meanwhile, Abbott’s phased reopening proved scatter-shot. At first bars were permitted to open at 50% capacity and restaurants at 75%. But near the end of June, he shut down the bars and restricted restaurants to 50% occupancy. That was how businesses such as Flava and officials like Kennedy ended up with an SAT problem on their hands.

Abbott later expressed regret for moving too hastily to reopen bars, but that didn’t stop him from intervening again in September when Hidalgo signed a joint order with Mayor Turner to delay in-person learning in local schools. Abbott rejected that move, too, saying in a statement that school reopenings were up to school boards, which “can base their decisions on advice and recommendations by public health authorities but are not bound by those recommendations.” As the academic year begins, each Houston-area school district is moving forward with a different plan: some virtual, some in person; some now, some later.

“The government needs to tell you when something is dangerous,” Hidalgo says. “But there’s just been huge confusion.”

One consequence of this confusion is that everyone has been left to rely on her own judgment about what is safe—which more or less means no one is safe. As I tour Houston, I find country dance spots such as Wild West and Neon Boots



closed until further notice. But closer to the Med Center and across the freeway from Beyoncé’s childhood home, the Turkey Leg Hut has a line out the door. The Rockets’

playoff push is jamming in patrons at the Eastside sports bar Bombshells. And the downtown poolside nightclub Clé is so packed at 1 a.m. that I decide it wouldn’t be safe to go in even with my N95 on. Working my way down the line outside, I ask a group of maskless women why they’re risking it. Kim, a 22-year-old in a leopard-print minidress, tells me, “Ain’t no different from the gas station. Ain’t no different from Walmart.”

The motivations are clearer down on Galveston Island, Houston’s beach retreat, a straight shot out of downtown on Interstate 45 past the Inner and Outer Loops. One Sunday along the Strand, Galveston’s historic shopping avenue, a 59-year-old woman named Maribel Castillo is drinking a Shiner beer with a girlfriend outside a shop selling kitschy beach bags. “I really think they’re stupid, and quote me on that,” she says, holding forth on mask rules and other coronavirus regulations. She’s on the island “doing my part” to help keep businesses open by shopping. “I’m not a Trumpist, but I do think this is political. It will be over when the election is over,” she says, cocking an eyebrow as she raises the bottle for another sip.

A couple of minutes away, the wide, hard-packed beach is busy, with families clustered beneath sports-team-themed canopies and young people gathering in the open beds of pickup trucks driven to the water’s edge. Paul Lucero, a father of three,

identifies himself as a Trump-voting Republican. Nobody in his family is wearing a mask. “I think if you want to put yourself at risk, you should go ahead,” he says. “The mask order is just the government covering its own ass.” He smirks and looks me up and down. “No one is wearing one out here except you.”

It’s true—I’ll go home later with tan lines from my N95 straps stenciled across my cheeks. There are worse fates. At one point I see a young woman packing up her things, looking a bit agitated. She identifies herself as Avery Lawson, an IBC (Islander by Choice) rather than a BOI (Born on the Island), and tells me she works as a funeral director. Pointing down the busy beach, she says, “This is the problem. We appreciate tourism, that’s how we make our money, but there is recklessness going on. It’s like there’s no rules, and it’s kind of scary.

“A lot of people don’t see it directly,” she adds. But she does—business is up.

“Everybody is being a dick,” she says and leaves.

Back on the north side of the city, not far from Walle’s district, a line of cars winds through a massive parking lot out onto a freeway feeder road. The lot is normally for two huge event spaces, Stampede and Escapade, but in times of crisis it’s repurposed. After Harvey struck, it became a clothing donation location. This morning it’s a drive-thru food bank. Sirius Ferdows, the venues’ co-owner, is sweating through his shirt with a bottle of water in his hand, overseeing a remarkably smooth operation. Harvey was like a dry run for this catastrophe, he says. Ferdows and his partners have offered their lot for several Thursdays now. Borden Dairy Co. and DiMare Fresh have donated milk and produce, and forklifts will be unloading trucks for the next few hours.

Many people will wait longer than an hour. By the end of the day, more than 2,000 drivers will have been served a box of food—potatoes, apples, beans, and 2 gallons of milk, all swiftly deposited into their trunk by masked student volunteers. I ask Ferdows how much each box is worth, and soon we’re on our phones looking up the cost of a 5-pound bag of onions at local supermarkets. We calculate that the total value is \$31 per car.

The vehicles are mostly late-model Corollas, minivans, and F-150s. “People were living a certain lifestyle, and that came to a stop,” Ferdows says, still counting apples. “Now they lost their job, and the car payments that were paused for a couple months are due again.” He shakes his head and almost shouts: “Everybody had a job before! Unemployment was at like 4%!” Indeed, in February, Houston’s unemployment rate was 3.9%; it swelled to 14.3% in April and settled back to 9.4% in July. The Greater Houston Partnership, a local chamber of commerce, estimates that at least 258,000 jobs have been lost since Covid hit. Ferdows says his two event spaces have gone from about 200 employees to none.

I weave through the cars on foot, tapping at windows with notebook in hand. Many of the drivers speak only Spanish; often they’re women, some with kids in the back. Others are men, alone. I soon find that Covid isn’t most people’s main

concern at the moment: It’s work and, more pressingly, food.

One of the men, Faustino—who like pretty much everyone will provide only his first name—works at a machine shop welding equipment for offshore oil production. His hours have been cut in half since March, “and now I just need any help,” he says. He’s still wearing grease-stained navy blue coveralls with his name in a white oval on his chest. “My job depends on oil, so when it is cheap, we don’t have work.” West Texas Intermediate crude prices collapsed from more than \$60 a barrel in January to less than \$12 in April before rising back to about \$40 over the summer. Faustino is thinking about doing construction work instead, like most of his neighbors, but for now he’s helping his wife teach their kids in his free time and waiting for the price of oil to bounce back.

“We need food,” Evelyn says candidly. She’s 16, riding in the passenger seat of a minivan, speaking for herself and her mom, who’s from Mexico and too nervous to say anything, Evelyn says, because she doesn’t have papers. “We only have cans, and now we’re having beans twice a day sometimes, and that’s all.” Her dad was laid off from his job in the meat section of a supermarket. “I’m the one who speaks English best, so now I will focus on finding a job to support us,” she says. When I ask if she’s worried about contracting the virus while job hunting, she smiles and shrugs.

Norma, who’s 51, has eight people at home. She says of her husband, “He’s trying to find work.” He used to install air conditioning units for businesses and homes but was laid off and now works only occasionally. They met in El Salvador as teenagers and came to Houston 20 years ago. “With it being so hot now, we thought he would have plenty of work,” she says. “But we can’t pay the bill for the air conditioning of our house. Even the air conditioner man is suffering in Houston.”

At the end of August, a more familiar form of disaster threatens: Hurricane Laura gathers over the Gulf of Mexico, her intensity ratcheting up swiftly and ominously from Category 2 to 3 to 4. Then, seemingly at the last minute, the storm turns north, sparing Houston but destroying other lives not so far away.

Relief from the pandemic seems at hand, too. In September the Med Center reports that the city’s positive test rate is at 7.8%, still above the target ceiling of 5% but much better than August’s 23%. The promising trends have Abbott initiating a new reopening—something local officials fear will amount to another attempt to pretend the danger isn’t really there. “The Governor is about to embark on the same course again,” Mayor Turner warns in a statement before Labor Day weekend. “The State is about to repeat its mistake, expecting a different outcome.”

Near the end of September, another deluge comes. Tropical Storm Beta drops 10 inches of rain. More homes flood, more cars drift away. Covid cases start rising again at Ben Taub. Crisis is brewing from every direction, and we’re as ready as we ever were. It’s as Hidalgo says: “We’re right on the edge of disaster. It’s almost become our way of business.” **B**

A Virologist



Whose Government



Trusts Him

In Germany, Christian Drosten has the ear of Chancellor Angela Merkel—and of millions of his countrymen via his wildly popular podcast

By Tim Loh

As Germany cleared away spent fireworks and slept off its hangovers on New Year's Day, Christian Drosten got a sobering wake-up call: A member of his team—he heads the virology department at Berlin's Charité hospital—reported that a strange pneumonia was spreading in the Chinese city of Wuhan.

For Drosten, a leading developer of tests for emerging viruses, there was an element of *déjà vu*. As a doctoral student in Hamburg in 2003, he'd discovered that the outbreak of severe acute respiratory syndrome, or SARS, then terrifying Asia was caused by a coronavirus. Although it was unclear whether a coronavirus was responsible for the Wuhan outbreak, Drosten fully understood the danger. While the viruses are common pathogens known to cause colds, some discovered in recent decades are highly lethal.

He alerted his staff to get ready for the possibility of a deadly pandemic. When Chinese researchers confirmed that the culprit was indeed a coronavirus and on Jan. 10—a Friday—published its genome sequence, the Charité scientists sprang into action. Working through the weekend, they pulled together samples of the SARS virus and other coronaviruses, aiming to make a test that could detect the new threat. Late on Saturday a team member tweeted, “Lab days are happy days! #Wuhan #Coronavirus.”

By Monday they had a test that could confirm whether someone had been infected by the novel coronavirus. Drosten shared the details with the World Health Organization, which published them on its website, and the test was soon deployed around the world. One place that declined to use Drosten's test was the U.S.; it came up with its own diagnostic tool, which turned out to be flawed and left the country blind for two months as the virus raged. Germany's test confirmed the country's first case on Jan. 27. There were 13 more in the coming days, at the time constituting the largest known cluster outside of China. Authorities sequestered Covid-19 patients, tracked down their recent contacts, and slowed infections.

“We knew the virus had arrived,” says Tobias Kurth, an epidemiologist at Charité who works with Drosten. “The message was, ‘OK, there's a virus. It spreads in certain ways. There are certain risks. But if we can identify them, we can isolate them, and then it can be stopped.’”

Ten months into the pandemic, some countries have practically eradicated the virus while others haven't come close. Comparisons are tricky, because luck has played a role, and some places enjoyed advantages such as geographical isolation; plentiful hospital beds, respirators, and protective gear; and trust among people, policymakers, and scientists.

Germany had most of these going for it, except for the geography part. Even so, it seems fair to say the country has done well with Drosten at the forefront of the fight, advocating a robust but clear-headed approach. Since developing the test, the 48-year-old scientist—tall and lean, with a mop of dark brown hair and a head that bends slightly forward, as if he's forever peering into a microscope—has led a research team at Charité that's explored how the virus spreads and affects people differently. He's shared thoughts with colleagues around the world, offered insights at press conferences alongside Germany's health minister, and advised Chancellor Angela Merkel—a role some have compared to that played by Dr. Anthony Fauci in the U.S.

But Drosten is even more famous in Germany than Fauci is in America, thanks to a wildly successful podcast he introduced in February. *Das Coronavirus-Update* rocketed to the top of Germany's podcast rankings, reliably outperforming programs devoted to sex, crime, and even soccer. Its format is simple: As often as five times a week, he spends an hour answering questions about basic science, the latest Covid research, and how societies might navigate the pandemic. Since starting the show, he's cut back on contact with the press, reserving most of his comments for the podcast. He declined an interview for this story.

Drosten's rise has earned him millions of fans—and more than a few enemies. Detractors argue that he wields too much influence, making him a punching bag for what they consider government overreach. After he suggested it could be a while before people might again pack into soccer stadiums, he received death threats, prompting the police to monitor his email.

A key to Drosten's popularity has been his ability to parry attacks from critics. In May, Germany's largest-circulation newspaper, *Bild*, accused him of making a math mistake in a study that concluded children may be as infectious as adults and suggested that schools shouldn't rush to fully reopen. When a *Bild* reporter contacted him and demanded answers to a series of questions within an hour, Drosten declined to respond and instead posted the journalist's email on Twitter. The newspaper, he said, was planning a “tendentious” piece, and he had “better things to do.”

That retort became a rallying cry for his swelling ranks of defenders. A German model proposed to him on Twitter, demanding a response within the hour or else she'd assume they're engaged. ZSK, a punk band in Berlin, released a song called *I Have Better Things to Do*. The accompanying music video features a cartoon Drosten angrily throwing away a ▶

◀ cellphone with *Bild* on its screen and blasting viruses with laser beams shooting out of his eyeballs. “Drosten is straight-forward, no nonsense,” says Vincent Racaniello, a microbiology professor at Columbia University, who praises Germany for trusting its experts during the pandemic.

In April, Racaniello invited Drosten to his own podcast, *This Week in Virology*. The show, which premiered in 2008, has attracted plenty of new listeners this year, but its reach is nothing compared with Drosten’s tens of millions of downloads—a source of bemusement for Racaniello, who can’t imagine an American scientist gaining so much cultural clout.

“Tony Fauci is wonderful,” he says. “But he’s not a coronavirologist.”

Drosten’s path to coronavirology started on the farm in northwestern Germany where he grew up. He served as a paramedic, then studied chemical engineering and biology at university before switching to medicine. He worked for a spell in an intensive care unit, but the experience haunted him. When patients died, he couldn’t stop thinking about them.

In 2000 he landed a position at the Bernhard Nocht Institute for Tropical Medicine in Hamburg, a state-funded biosafety lab, where he earned respect for his diagnostic chops that helped him detect Ebola, dengue, and other viruses—and for his ability to explain what it all means to nonscientists.

In March 2003 a couple from Singapore was pulled off a plane in Frankfurt and hospitalized with a mysterious respiratory ailment that resembled the one breaking out across Asia. While visiting Frankfurt a few days later, Drosten obtained a sample of the virus cells, drove five hours back to Hamburg, and over several long nights determined that the pathogen was a coronavirus. While researchers in the U.S. and Hong Kong made the discovery at about the same time, Drosten pushed ahead and developed a test for the virus—then offered free step-by-step instructions for making the test online.

This work, published in the *New England Journal of Medicine*, earned an award from the German government. But the test never got much use. SARS disappeared almost as fast as it came, ultimately infecting only about 8,000 people thanks to social distancing rules and because it was hard to transmit. The current outbreak has seen at least 33 million infections and more than 1 million deaths.

In the aftermath of SARS, scientists concluded that the virus had made a jump to humans from bats. Drosten knew of some caves about 40 miles north of Hamburg where bats congregate. One summer day he called Florian Gloza-Rausch, the head of a bat research center at the caves, who was about to go on vacation. “I said, ‘Either come today or in two weeks,’” Gloza-Rausch recalls. “He said, ‘I’ll hop in my car.’” Before long, the pair discovered that bats in Germany carry coronaviruses, too, some of the first known to do so outside of China. They subsequently traveled to Bulgaria and Ghana in search of more virus-laden bats.

By then, Drosten was head of virology at the University of Bonn, where his team developed tests for the Zika flavivirus



and the coronavirus behind Middle East respiratory syndrome, or MERS. When he got the Charité post in 2017, he said he wanted to use the Berlin facility’s vast resources to dig deeper into the diversity and evolution of viruses and better understand how epidemics start. Public-health systems, he said, needed to brace for the next pandemic. When it came, the most important tool would be early detection.

Drosten’s preparations, and his quick thinking in January, paid off. By the end of the month, his test had confirmed that the coronavirus was breaking out in Bavaria. Auto parts supplier Webasto SE had flown employees in from China for several days of training. During meetings at headquarters near Munich, one of those people felt a little feverish but assumed it was jet lag. After she flew home to Shanghai, she was hospitalized. Before long, nine Webasto workers in Germany tested positive, along with five family members.

That week, Drosten made one of his first big public appearances of the crisis, on the TV interview show *Talk aus Berlin*. With SARS, he said, the virus had to get down into the lungs before it could replicate enough to spread. By then most people felt so sick they couldn’t go out—a key reason SARS was brought under control. On the other hand, the flu can replicate in the throat and infect others before a person feels any symptoms, making it far harder to stop.

Where in that spectrum, Drosten mused, would this new coronavirus fit? Would it pack such a powerful punch that infected people would simply stay home? Or would early symptoms be so mild—perhaps even nonexistent—that people would, say, go out and play soccer or basketball, or ski?

“And infect everyone else,” the host said.

“Exactly,” Drosten said. “That’s what we’re looking at to determine whether this will be easy to control, or hard, or even impossible.”

It didn’t take long for it to become clear that controlling the virus would fall somewhere between hard and impossible. After it silently spread for weeks in northern Italy, hospitals there were suddenly overwhelmed. Spain faced the horror next, then France. With deaths mounting, governments resorted to mandatory stay-at-home rules that would have been unthinkable a few weeks earlier. Germany’s infections

accelerated, too, set off by, among other things, vacationers returning from ski trips in the Alps.

As anxiety built, Norbert Grundei, a podcast producer for the Norddeutscher Rundfunk public broadcasting system, spotted Drosten on TV and typed a long, formal email with a proposal. “How would it be,” he recalled writing, “if we spoke with the man who’s the absolute expert on this topic in Germany, who advises the federal government and the foreign ministry? If everyone in Germany got the same level of information as the political decision-makers?”

Drosten’s immediate response: “Let’s start Monday.”

Das Coronavirus-Update premiered on Feb. 26, with Drosten, in Berlin, answering questions from a science editor in Hamburg. He hadn’t been sleeping well of late, he allowed. He’d been fielding emails and phone calls from all over the globe, asking how to properly use his test. From that he surmised that the virus had spread a lot more widely than official statistics suggested and that labs in many places were ill-equipped to manage the crisis.

Germany, however, had a lot going for it. Over decades it had developed one of the world’s best systems of labs and set up the greatest number of intensive care beds in Europe. And, because of its almost universal health coverage, people had little incentive to put off getting tested or seeking care. Nonetheless, Drosten cautioned that even though the virus likely posed little danger to most individuals, it represented a massive threat to Germany as a whole, potentially overwhelming hospitals and doctors.

Drosten is part of a group of scientists counseling Chancellor Merkel, who has a doctorate in quantum chemistry and is often praised for her composure and command of facts. By mid-March, Merkel was being accused of not reacting boldly enough. Case numbers were mushrooming in Germany, and health officials were struggling to keep track of infections. About a week after France and Spain instituted strict nationwide lockdowns, Merkel introduced a looser one in Germany—closing schools and most businesses, but never forcing people to stay inside their homes. They could still go out and exercise or hang out with family and, before long, friends.

Germany’s performance hasn’t been perfect. Early on there were shortages of masks and other protective gear, causing a spike in infections among doctors and nurses. And the country never brought infection levels as low as, say, Japan, New Zealand, or South Korea. Still, its fatality rate has stayed strikingly low—as of September, five times lower than those in the U.S., U.K., Italy, and Spain.

With life returning to something resembling normal in late May, Drosten took a victory lap in a cover-story interview with *Der Spiegel* magazine. Germany, he said, had reacted “quite efficiently,” and his team’s test had given politicians a month’s head start in managing the crisis, saving perhaps 100,000 lives. By late June, as new infections fell to a few hundred a day (from a peak of 7,000 in March), Drosten said on Episode 50 of his podcast that Germans had earned the privilege of a relaxed start to summer—though trouble could



Marchers in Berlin in August called for Drosten and others to be locked up

return if people abused their freedom. With that, he put his show on summer break and went on vacation.

Millions of other Germans did the same. Cars flew down the autobahns, and people packed into trains, albeit mostly wearing masks. From North Sea beaches to Alpine lakes, hotels did a booming business. As restaurants opened up, their terraces filled with diners and drinkers.

Schools and day-care centers reopened, too, and by August, infections began rising—along with uncertainties. Politicians debated how best to increase testing, especially for people returning from “risk areas” with higher levels of the virus. Drosten, who’d been largely silent over the summer, resurfaced with an 1,800-word manifesto in the newspaper *Die Zeit* headlined “A Plan for the Fall,” in which he warned of a new wave of illnesses. A few weeks later, he relaunched the podcast.

Big questions remain for Germany, he says. Will schools touch off a surge in cases? Will the winter bring trouble, as few Germans have developed immunity? And his thoughts on testing have evolved. If health officials get overwhelmed in the coming months, he argues, they should stop trying to capture every Covid case. Most people pass it on to only one other person anyway, posing little systemic risk. But occasionally, someone spreads it more widely, creating a cluster of infections that really drives the pandemic. To avoid another lockdown, he says, Germany must focus on identifying and preventing those clusters.

The situation continues to deteriorate, with case numbers skyrocketing in France, Spain, and the U.K. On Sept. 23 in Washington, Fauci appeared exasperated at having to debate Senator Rand Paul of Kentucky over the merits of basics such as mask wearing and social distancing.

In Berlin, thousands took to the streets to protest measures intended to keep the virus in check. But Drosten has said such people represent only a sliver of public opinion in Germany and praises his countrymen for not politicizing the issue. As infections edge up, the country is still vulnerable, he says, but it’s equipped to recognize trouble early and react swiftly. “It’s possible that we can prevent a second wave,” Drosten told public TV station ZDF. “But that will require intense focus from everyone. At the moment, that’s the challenge.” **B**

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October 5, 2020

Edited by
James Gaddy

Businessweek.com

The Rarest of Them All

Just about any product can be deemed “exclusive” with clever marketing, but we found a few that are in truly finite supply
Illustration by Franco Zacharzewski

A McDonald's sandwich and an Hermès handbag may sound like improbable counterparts, but the appeal of both arises from the same impulse: scarcity. That five-figure status purse is so hard to buy it's supposedly sold only to those willing to join a waiting list; likewise, the McRib appears for a short time each fall, as if out of nowhere, sparking a frenzy among fans who resort to using an online locator to find the nearest supply.

It's not about "good taste," either: The appeal is an instinct hardwired into the human brain. "As things are unavailable, we've learned we need to fight harder to get them," says Kelly Goldsmith, a behavioral scientist and associate professor of marketing at Vanderbilt University whose research focuses on scarcity. "Whether that's bison meat when we were cave people or A grades at school when you're marked on a curve."

Americans, who are more acquainted with abundance, are especially susceptible. Think of supermarkets bursting with 100,000 different products or the one-click, two-day time frame it takes to have anything we want shipped straight to our home. In our brain, a lack of something triggers a stronger reaction than too much.

Scarcity marketing is more common in the luxury sector than anywhere else. Scoring a hard-to-find sneaker is more than a purchase—it's an ego-boosting success, Goldsmith says. "You're not only showing the rest of the world how special you are," she says. "You're showing yourself that, too."

Economic uncertainty is likely to further burnish the appeal of products that seem scarce, according to research by Eesha Sharma, an associate professor at Dartmouth College's Tuck School of Business. Thanks to the instinct dubbed compensatory consumption, she says, "if you feel like you have fewer financial resources than other people, you offset the perceived deficit by acquiring things that are unavailable to others."

Unlike the supply of the McRib and the Birkin, which are artificially throttled, some products do exist in truly finite quantities. They might be limited because of their rarity, such as a bottle of Benedictine rescued from a sunken ship. Others require a complex manufacturing process that cannot be replicated over and over. We've scoured the world for 26 of them to get while you can. —Mark Ellwood



5

Weeks it takes to finish a Ripley shirt

Style

SCOTT FRASER SHIRTS

The British menswear designer has a personal obsession with Italian-American knitwear from the 1950s through the 1970s and estimates that he has at least 200 pieces in his closet. Fraser used those classics as starting point for a *Talented Mr. Ripley*-inspired collection, which is produced outside Milan by a team of four people. Each merino wool piece takes about five weeks to finish. £310 (\$400); scottfrasercollection.com

CHRISTY DAWN DRESSES

The design team at Christy Dawn in Los Angeles relies on dead stock fabric supplier Ragfinders of California for as much as 98% of its raw materials, says Chief Executive Officer Aras Baskauskas. Bolts as short as 3 yards go toward producing one-off designs and limited runs. The origins of this approach

are practical: As a startup, it couldn't afford the minimums that most textile manufacturers mandate, and it's since become a signature of the brand. From \$198; christydawn.com

GOLD & WOOD EYEPIECES

Ten craftspeople work in the Luxembourg atelier of this ultraluxe optician, and it can take as many as three days to produce a single pair of glasses. Collections include one called Supersonic, which incorporates shards of the wing of a decommissioned Concorde into the design. Another, Copa, comes with 23-karat gold leaf laid by craftsmen in Versailles who use fiercely guarded, proprietary techniques. From €2,014 (\$2,349) per pair; gold-and-wood.com



20

Editions in which this Salvagni Poseidone vessel is available

DARA LAMB WOMENSWEAR

Bespoke women's tailor Lamb relies on vintage fabrics dating to the '80s and '90s for many of her designs. Her fine silks, tweeds, and woolens are often from small European mills no longer in existence, using techniques that digital printing and modern looms have rendered outmoded. The silk prints, for instance, were screened on long tables with hand-mixed inks. Lamb typically only has enough scraps of these fabrics to make three unique garments at most. *Handmade jackets from \$3,650, silk print blouses from \$995*; daralamb.com

Home

WOLF WHISKERS BRUSHES

Peter Wolf is a U.S. Navy vet turned artisan who now fashions handmade wooden shaving brushes in his studio in Hampton Roads, Va. Wolf works only with the finest materials, including High Mountain White badger hair for the bristles. Because he hand-turns each on a lathe, production is limited to no more than 40 such brushes each month. He offers two dozen or so standard handles but also accepts custom commissions. From \$78; wolfwhiskers.com

ACHILLE SALVAGNI GLASSWARE

Italian interior designer Salvagni stumbled on a centuries-old haul of unused pigments from the same Murano factory that design legends Napoleone Martinuzzi and Tomaso Buzzi once used. Although these archival colors often incorporated now-outlawed chemicals, Salvagni persuaded glass blowers to use them in a collection of vessels whose shades are impossible to replicate. From \$8,700; achillesalvagni.com

LUIGI BEVILACQUA CESELLATO VELVET

Venice was once the world's velvet-making hub, where more than 1,000 weavers specialized in the plush fabric. Today only a handful remain, including this producer who specializes in *soprarizzo* velvet, which combines cut and uncut pile to maximize softness and texture. Using original 18th century

100

Bizzaria orange plants offered for sale each year

looms, the material is produced through such a painstaking process that no more than 12 inches in length is made daily. *Price on request; luigi-bevilacqua.com*

40

Shaving brushes Wolf Whiskers can make per month

HYDROWOOD FURNITURE

When Tasmania's Pieman River was dammed in 1986 to generate hydroelectricity, nearby forests were flooded and the timbers there submerged. An entrepreneur has begun retrieving the preserved logs from the depths, dubbing the virgin trunks "hydrowood." An estimated five years' worth of wood is available for salvage. Such prized finds have been used by local furniture maker Simon Ancher in one-off pieces. *Custom couch from \$10,000; simonancherstudio.com.au*

UXUA RETALHO LAMP

Erstwhile Diesel creative director Wilbert Das ditched fashion to operate a boutique hotel in Trancoso, Brazil, where he's returned to design. His Rural Modern furniture collection uses only material sourced from within a 5-mile radius; the Retalho lamp shade is made solely from dead stock fabrics, mostly antique linen, and takes a month to complete. He's made eight to order so far. *\$850; uxuadas.com*

Food

CARTER CUTLERY

As a karate-obsessed teen, Murray Carter stumbled on his future profession on a trip to

Japan. While there he met 16th-generation bladesmith Sensei Yasuyuki Sakemoto, whose family specialized in forging samurai swords. Carter spent six years apprenticing with him before returning to the U.S. to open his workshop, where he and his team turn out a limited number of hand-forged, laminated steel knives each year. *From \$180; cartercutlery.com*

BONA FURTUNA RISERVA DI NONNA ROSA OLIVE OIL

Seagate Technology LLC Chairman Steve Luczo bought a patch of land in Corleone, Italy, in memory of his grandmother Rose, who once tended the olive trees there. Those groves now produce gourmet extra virgin olive oil, his passion project. The most rarefied edition is drawn from only nine trees, some of which are 1,500 years old. *\$150; bonafurtuna.com*

TRESCO HONEY

Once a year, Andrew Lawson harvests honey from the hives of the botanical garden on Tresco, in the Isles of Scilly, off England's Cornish coast. Thanks to Galapagos-like weather patterns protecting them from incursions of disease that now blight most colonies, these bees offer the ultimate organic honey treat. Lawson doesn't sell the results commercially; he posts an alert on the garden's social media account when a few jars are available. *First come, first served. £7 per jar; tresco.co.uk*

BIZZARIA ORANGE

The origins of this aptly named citrus fruit date to the Medici-fueled

Renaissance heyday of Florence, when botanical experiments were commonplace. Bizzaria is a graft chimera in which the cells of the rootstock and cultivar end up blending, so the resulting plant displays traits of both parents—in this case, a Florentine citron and a sour orange. Once thought lost, it was rediscovered by gardener Paolo Galeotti in 1980 and is propagated in limited numbers for sale. A mere 100 plants are available for purchase each year. *From €35 per plant; oscartintori.it*

POMPONA VANILLA

Four foragers. Three hours. One bee. The pompona vanilla pod is harvested by a tiny group that wades into the Peruvian Amazon to hunt down a wild-flowering alternative to the standard vanilla plant. Humans hand-pollinate most of the pompona pods, but the aptly named endangered dilemma bee does it naturally. It's the only insect able to help the mythical plant, as it lands on the flowers when they open for three hours once a year. The resulting pods are five times larger than a standard bean and have a distinctive smoky, leathery aroma. The entire annual harvest maxes out at a couple of hundred pods. *About \$25 per pod; burlapandbarrel.com*

Drink

COGNAC FRAPIN 750

Founded in 1270, Cognac Frapin marks its 750th anniversary this year by introducing a made-to-order blend relying entirely on liquid drawn from barrels that date to the 19th century. Limited to 21 bottles, one for each generation of the family, this blend is packaged in a Baccarat decanter and a wooden box, complete with a key to lock it away from thirsty guests. *\$50,000 per bottle; cognac-frapin.com*

ZWACK UNICUM RISERVA

The standard edition of Zwack is a staple herbal liqueur in Hungarian bars, made by the namesake family since 1790. A new limited-edition riserva is a pet project of the latest generation to steer the distillery, siblings Izabella and Sándor. They take ordinary unicum and

21

Bottles of Cognac Frapin's 750th anniversary blend that will be released

age it not once but twice before adding some Tokaji wine from the cellars of Izabella's own winery. Both bitter and fruity, the result is a whiskeylike after-dinner drink. Only 13,000 bottles are made each year. *About \$30; zwackwebshop.hu*

BOLLINGER VIEILLES VIGNES

In the late 19th century, phylloxera aphids ravaged the vineyards of the Old World. There were a few exceptions, though: Small patches of land proved resistant to the blight for reasons that remain unclear even now. One of them was on the Bollinger estates in Champagne, where the vines still produce limited-edition cuvées, known as *vieilles vignes* ("old vines"). About 2,000 bottles are produced at a time, but only in exceptional years. *\$1,050; vintus.com*

OCEANX BENEDICTINE

Last year, OceanX recovered a stash of rare De Haartman & Co. Benedictine liqueur, originally intended for the czar of Russia, from the 1917 shipwreck *S.S. Kyros*. The salvage company has started selling a handful of the 900 or so bottles to ordinary buyers. A selection of cognac found in the same wreck is also available. *From \$7,000 per bottle; oceanxteam.com*

3

Days it can take to produce a pair of Gold & Wood glasses





A Rünge RS010

A Higher Plane

Christopher Rünge's handmade driving machines are like nothing else on the road. *By Hannah Elliott*

A barn in Minnesota is the kind of place where a classic car collector might find a vintage vehicle that, with a little help from a reproduction specialist, could end up being worth something in a few years.

But Christopher Rünge doesn't deal in classics. In his barn, on a family farm outside Minneapolis, he builds his cars by hand, one at a time, by himself, without a blueprint. Aside from the occasional help from his teenage son, the man works alone. He estimates it takes 2,000 hours to get one built.

Every Rünge vehicle is sheathed in aluminum polished so deeply its surface reflects like a surgeon's tray. The FF004 model has curves that undulate down the length of the car, whereas the compact FF007 Gullwing is a chrome cannonball on wheels. The 40-year-old Rünge is inspired by the 1950s-era cars built and raced by the greats—Ferrari, Jaguar, Maserati, Porsche—except that each one of his creations is unique. Prices start at \$225,000.

He came to his current obsession in a roundabout way, though the benefit of hindsight hints at a common thread.

As a teenager he worked with a local missionary optometrist repairing medical equipment to send overseas. In the early 2000s he was designing gear for Burton Snowboards.

In 2010 he visited an elderly woman in South Dakota who'd posted a '67 Porsche 912 for sale on Craigslist. "She lived on a 3,000-acre farm with her husband, who had recently passed, and was selling the car," Rünge says. "I hooked up a trailer, drove five hours, and when I got there, there were entire barns filled with old parts and tools—an English wheel, aluminum bodies, homemade contraptions. Aisles of them."

He bought the entire lot, with one provision: He promised he'd use the tools himself, not resell them. The first thing he used them for was to craft a car seat from a single sheet of aluminum, which quickly led him to try his hand at a fender. The next step was building a whole vehicle. (He uses engines from other cars, including a Porsche 356.) It took a year to finish.

Rünge dubbed it the FF001. In 2012 a man at a local cars and coffee gathering saw it and asked for one of his own. "I had absolutely no intention of selling it," Rünge says. So he made him the FF002.

His most recent creation is the RS010, which features a full steel tube frame and a 2.3-liter, 200-horsepower flat-four mid-engine mated to a four-speed "longbox" transmission, which puts cruising speeds in fourth gear comfortably at 80-plus mph. Interior controls and toggle switches are taken from 1950s aircraft, and a clock from a Soviet MiG jet is in the dash. The cockpit is even insulated and sound-deadened, with 12-volt electric air conditioning, making the drive very comfortable. The RS010 weighs about 1,600 pounds overall, about half the weight of an average midsize sedan.

Rünge has made 10 cars so far, and three more are almost completed, including an R2 that will be out within weeks. To get one of your own, the wait time is three years. **B**

Undercover Luxury

In Laurent Ferrier's world, a watch can be \$185,000 and still be discreet. *By David Graver*

As far as hobbies go, watch collecting is one of minutiae: Case materials, dial colors, and the type of branding can all influence the value and desirability of a timepiece. And that's before you even get into the guts.

For Swiss watchmaker Laurent Ferrier, there's no such thing as a minor detail. When he introduced his first piece in 2010, it included a tourbillon—a challenging, expensive complication that helps protect timekeeping accuracy. Normally, brands showcase them on the front of the watch face, but Ferrier hid his behind the dial. The point was reliability and precision, he says, “not to show off.”

That watch, the Galet Classic Tourbillon Double Spiral, would go on to win the premier award in the industry, a Grand Prix d'Horlogerie de Genève, and cement Ferrier as one of the most exclusive brands in the world.

Its aesthetics have since become the ultimate “if you know, you know” signifiers for discerning collectors: signature spear-shaped hands (referred to as *assegai*), equally slender time indexes, and a smooth case with rounded corners.

“Laurent Ferrier watches are for connoisseurs who seek understated excellence—a brand under the radar,” says Paul Boutros, head of watches for the Americas at Phillips auction house. “Collectors want what others do not have or cannot get. There's the personal satisfaction that you have something super rare and of extremely high quality.”

Born in Geneva in 1946, Ferrier is the son of a watch restoration expert. “I have always wanted to be a watchmaker,” he says. “I wanted to work with my father on great complications as he had been doing all his life. I even started watchmaking school with this goal in mind.” Unfortunately, before he finished school, his father began to show signs of Parkinson's disease and had to sell the workshop.

Ferrier began work in the movement-prototype department of Patek Philippe SA, though by 1974 he'd been appointed as a

creative director. Through his three decades with the brand, he would rise up the ranks to become a technical director.

Then, at age 62, three years before he could have retired, he departed Patek to start his own brand with financial support from his longtime auto racing partner, French businessman François Servanin. (They placed third at the 24 Hours of Le Mans in June 1979—right behind the team of actor, fellow amateur racer, and watch collector Paul Newman.)

Over the past 10 years, Ferrier has developed a series of award-winning movements—the component that powers a watch—and impressive complications. The 2018 Galet Annual Calendar School Piece, for instance, has a hand dedicated to ticking off the days of the month around the dial.

A single person assembles all his timepieces from start to finish, and movements are developed in-house from the ground up. But everything is done in a subtle way. “What I like the most about a watch is the discretion,” Ferrier says, “the purity of the lines, the refined simplicity, and the balance.”

The brand produces only about 150 per year—by comparison, Patek made 60,000 in 2019—but this year has proved to be more challenging than normal. Switzerland restricted watch manufacturing for multiple weeks because of the pandemic; data from the Federation of the Swiss Watch Industry show that timepiece exports dropped 62% from April to June.

Without the support systems of a luxury conglomerate, independent watchmakers such as Ferrier run a greater risk of folding. “Only so many people can make watches like this,” Boutros says, “so in a year like this one,

because of closures due to Covid-19, they're most likely producing less than normal years.”

But independence can be an advantage, too. “We have a limited number of pieces by definition,” Ferrier says, “but that's also what's allowing us to take time to do things properly.” **B**



GRAND SPORT TOURBILLON
First released in 2019 to celebrate the 40th anniversary of Ferrier's Le Mans finish, this year's model comes on a stainless steel bracelet. Only 12 will be made. \$185,000; laurentferrier.ch

Form Over Function

Treating furniture like contemporary art has fueled a boom in collectible design. *By James Tarmy*



The Bee's Knees (2017) by Wendell Castle

For those who believe a chair is simply for sitting, the idea that furniture can be “editioned” might come as a surprise. After all, a couch is just wood, fabric, and stuffing—why not make a million of them?

Dealer Marc Benda takes a different view. At Friedman Benda, the New York gallery he co-founded in 2006 with Barry Friedman, he specializes in furniture and objects that can be made only a few times at the very most. Over the years he’s sold an almost 6-foot-high bronze and rubber rocking horse from Dutch designer Marcel Wanders; mirrors from American sculptor Misha Kahn made from automotive paint and resin; and chairs by the Japanese studio Nendo

that are constructed out of the paper Issey Miyake uses to make his famous pleats.

“The determination if something remains unique or an edition, or is not limited at all, is mostly dictated by the materials,” Benda says. “We have a golden rule at the gallery: We don’t limit an edition if it’s perfectly possible to make it in large batches. So we don’t just take an industrial product and slap some gold on it and call it a limited edition.”

In fact, when he begins to work with a designer on a piece, he never starts with how many the designer will make. “Edition size, pricing, marketing—all the front-end most people see is not discussed for the first, let’s say, 80%

of the dialogue and the making of the piece,” he says. “It’s really something that comes later.”

Instead, Benda says, his furniture’s edition sizes are determined “by economies of scale.” Take Wendell Castle, whose couches have sold at auction for more than \$300,000. “He made chairs from boards that were stack-laminated,” a process in which he would glue together roughly inch-thick slabs of wood and then carve them into furniture.

At first, Castle, who died in 2018 at the age of 85, wielded a chainsaw to do the carving; later in life, he used robots. “Some of those chairs were made in a shape that was easy enough to replicate that it made sense to do an edition of eight,” Benda says. “But if he made an edition of 50, he’d have spent 10 years making the same chair.” It’s just “not practical,” Benda says.

Practicality is an interesting word choice given that his business balances at the very peak of the furniture market, where a single Roly-Poly lithium-barium crystal chair by Faye Toogood costs \$100,000—about the price of a fully loaded Mercedes.

Loïc Le Gaillard, who co-founded Carpenters Workshop Gallery in 2006, says the price tags of furniture in his showrooms should be compared to those found at Sotheby’s auctions. Among its locations in New York, London, San Francisco, and Paris, the gallery has exhibited products from boldface names not typically associated with decor: marble pedestals by Karl Lagerfeld, hand-painted aluminum chairs by Yinka Shonibare, and massive brass floor lamps by Virgil Abloh. “You have to put everything in relation,” Le Gaillard says. “You have people spending \$100 million for a painting by Jean-Michel Basquiat.”

Although that might be an overly optimistic way of framing it—using his logic, a million-dollar teapot is also a bargain compared with a Basquiat—the market for editioned furniture has benefited from its association with less utilitarian artworks.

“There’s been a collectible design market for a while, but I think it’s really spread and extended since 2010,” says Mélanie Courbet, the owner of Les



Raphael Navot, who was born in Israel and works in Paris, designed his Archetype I Bronze piece (2020) as a 4½-foot-long cast-bronze table in an edition of eight. After the table is cast, the shimmering cognac patina is rubbed into the table by hand. \$57,000; ateliercourbet.com



Nacho Carbonell was born in Spain and is now based in the Netherlands. He’s known for creating organic forms out of decidedly inorganic materials. His one-of-a-kind Light Bronze Mesh lamp (2019) is made entirely out of bronze, continuing a series of fantastical shapes he’s developed for more than a decade. €38,000 (\$44,178); carpentersworkshopgallery.com



Detroit-based Chris Schanck covers the steel armature of his works using a process he’s termed Alufoil. For his Shell Chair: Red Gold (2019) series, he creates the frame, overlays it with a delicate leaf of paper-thin aluminum foil, then coats it in a layer of resin. The striking object functions as a chair but looks like an otherworldly artifact. \$38,000; friedmanbenda.com

Ateliers Courbet, a design gallery in New York. “In some ways it follows the art market’s expansion, but there’s also more appreciation for design. People are educated about it and exposed to it.”

Le Gaillard says his business has grown about 20% annually for the past decade. And amid the pandemic, “the art and design collector market has stayed steady-ish,” Courbet says. “The established, blue-chip segment of the collector market seems to have done pretty well under the circumstances.”

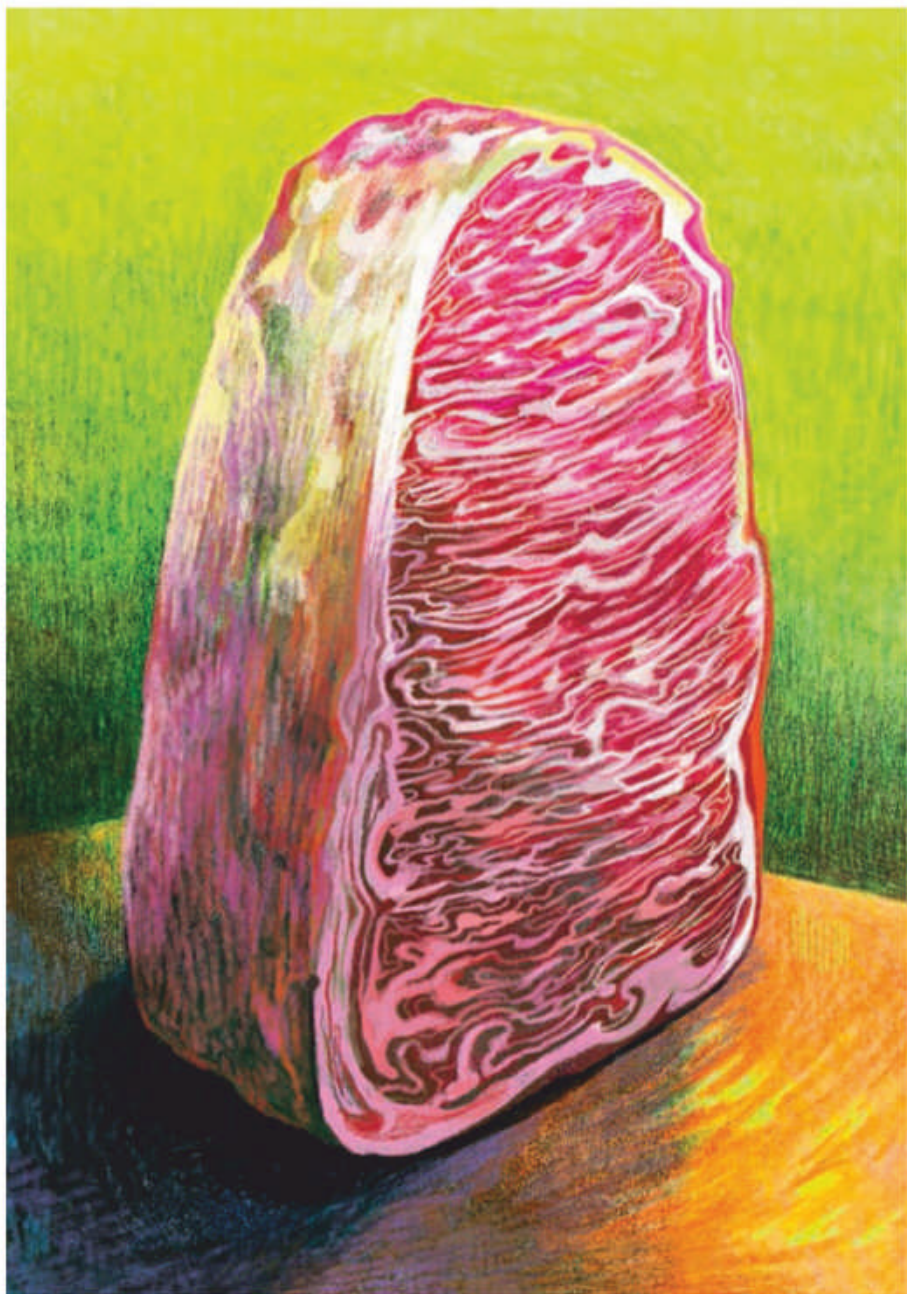
And yet, even as the art market has lifted the value of editioned furniture as a whole, dealers say the functionality of a particular piece, no matter how irrelevant that may be to the result, often holds it back from reaching what they think is its proper price.

People need to “lose their intellectual barriers about the fact that this tiny element of functionality should be a deterrent to a piece appreciating in value,” Le Gaillard says. “The minute they realize this, they’ll jump.” Limiting the edition size of an object can help clients make that leap. “We consider [our designs] artworks, so we need to use the language of contemporary art,” he says. “If Giacometti created sculptures in editions of eight with four artist’s proofs, then there’s no reason why we shouldn’t do the same.”

And though Benda is explicitly against arbitrary edition sizes, he acknowledges that “artworks become less meaningful when you have people overproduce and [buyers] are following a trend as opposed to their own intellect.”

In contrast, when a piece of design is “rare and genuinely an important expression of its time,” he says, “I’ve never seen those works truly disintegrate” in value. Castle’s chairs, for instance, sold for about \$1,000 in the 1960s; in 2018 a chair from that period sold for \$262,500 at Phillips in New York.

Limited-edition design is really shorthand for a type of furniture that provides an aesthetic and intellectual experience that’s different from everything else. “You’re buying something that’s not just a thing,” Benda says. “It’s something that enhances your life.” **B**



Steak Majeure

Ozaki beef is turning
the most jaded of carnivores
into marbling maniacs

By *Kate Krader*

Even in New York, a city blessed with the best in prime beef, some cuts have the power to grab people's imagination. One of the more recent was a \$185 steak sandwich that Don Wagyu, a compact storefront in the Financial District, started selling in 2018.

The star of that dish, which created lines down the block, was a thick, melt-in-your-mouth piece of meat densely marbled with flavorful fat. Called Ozaki, the beef inside that sando came from one small farm in Japan. Generally speaking, Japanese beef is richer and has a more luscious bite than its counterparts around the world because of the care farmers take with their cattle. That's why *wagyu*, which means

"Japanese cow" and encompasses any of the country's four breeds, has become synonymous with quality.

But within the world of premium wagyu, Ozaki is in a league of its own. The brainchild of Muneharu Ozaki, who took over his father's 100-head ranch in the mid-1980s at the age of 24, the beef comes from a herd of 1,600 Japanese Black cattle raised in Miyazaki prefecture, the region of the country most renowned for the quality of its meat.

Ozaki spent two years at a cattle ranch in Washington state and studied livestock at the University of Nebraska at Lincoln before deciding that the American way of mass-producing beef was not for him.

Instead he began raising cattle in a singular fashion, starting with an all-natural diet. "It's a special feed that's a blend of 13 kinds of grains that I've developed over 20 years," Ozaki says. The mix includes barley, soybeans, and wheat, and takes about two hours to prepare fresh each day.

Age also helps make Ozaki beef extraordinary. Most premium cows are raised for 28 months before they're slaughtered. After that the animals grow more slowly, and most producers say it's no longer cost-effective to continue feeding them. Plus, as animals get older, there's a greater chance for them to get infected with disease. Ozaki, who eschews antibiotics and steroids, raises his cattle for as long as 36 months, allowing the meat to develop deeper flavor and for the fat to be better marbled within the muscle.

"In Japanese, there's a word, *otaku*," says Simon Kim, owner of Cote, New York's lauded Korean steakhouse. "It basically means 'maniac.' It's like an older person who goes all the way into what they believe. Sometimes it's a negative term, but for Ozaki it's completely positive."

Kim is considering carrying the meat at Cote in the coming months as a way to entice diners back as New York eases coronavirus restrictions. "Fall is always important to restaurants," he says. "This year, when it means that indoor dining reopens in the city, it's even more important. I'm looking at things that make an impact." If it's added, the beef would be the most expensive one on his menu: He sells A5 wagyu, the top classification, for \$30 per ounce; Ozaki would be about \$45 per ounce.

In the next three years, Ozaki plans to increase his herd size to 2,000. But it still won't be easy to get. The beef is sold in small quantities in 32 countries, including Australia, Saudi Arabia, and Singapore. In the U.S., Tomoe Food Services Inc. is one of the few purveyors. The company's president, Naoki Takeshige, says the price is about 30% higher than other wagyu he carries.

This fall he intends to offer it at two New York restaurants he's preparing to open: J-Spec, a beef-focused spot scheduled to welcome customers this month; and Kiwami, a Japanese fusion eatery. He also supplied Don Wagyu with beef for its sandwiches before it closed in September 2019.

But the legend of Ozaki beef lives on: Takeshige says he'll serve it in a sando as an occasional special at J-Spec. Price to be determined. **B**

Most Champagne is nonvintage. Instead, grapes from various years are blended to create a consistent flavor. (That's why brands such as Veuve Clicquot always taste the same.) In the best years, vintners will sometimes release a wine using only grapes from a singular, superior harvest; 2010 wasn't one of those years. Much of the crop was lost after two months' worth of rain fell over two days in mid-August. That led to an invasion of botrytis—or gray

mold—and rot. This summer, Dom Pérignon became the first major house to release a 2010 vintage after discovering that as the surviving grapes ripened, they'd retained a high level of acidity, a rare occurrence. Its small run (\$188 a bottle) balances rich fruit flavors with a refreshing character that Vincent Chaperon, the brand's chef de cave, describes as “vigorous yet graceful.”

THE COMPETITION

- Champagne Pol Roger's “Sir Winston Churchill” is named for the prodigious bubbly lover, who drank an estimated 42,000 bottles of Pol Roger in his life. The 2009 cuvée (\$285) is its most recent vintage.
- Krug's Grande Cuvée takes a different approach. Its latest release, the 168th Edition (\$199), blends 2012 grapes with a mix of reserve wines from the previous decade.
- Originally created for Tsar Alexander II, Louis Roederer Cristal is the house's grand cuvée. Its 2012 vintage (\$249) is made exclusively from grand cru vineyards and aged for six years before release.

Pour One Out

Dom Pérignon's 2010 vintage redeems a year winemakers wish to forget
Photograph by Heami Lee



THE CASE

Dom Pérignon can sometimes take awhile to open up to get the full expression of aromas, but the 2010 vintage is very accessible, thanks to the intensity of the chardonnay grapes and the acidity that helps keep the sweetness in check. Notes of tropical fruits and crisp citrus combine for a long, lively finish. It's powerful—but the concentrated flavors and balance are undeniably Dom. You can pop it now, but if you've put your normal 2020 celebrations on hold, it can age for four or five years—or longer, if stored properly. \$188; domperignon.com

China Has Its Own K-Shaped Recovery

By Shuli Ren

China doesn't care about its bottom 60%.

The country seems to have bounced back from the Covid-19 slowdown. Exports are growing by double digits, and retail sales, which had been lagging for months, are back to pre-virus levels. With daily life mostly back to normal, the country seems to be humming again.

But poorer households are still struggling. The rebound Beijing engineered is K-shaped, exacerbating widening income inequality, which was already a problem before the pandemic.

Most households in the bottom 60%, or those earning less than 100,000 yuan (\$14,670) a year, said their wealth declined in the first half of 2020, the China Household Finance Survey finds. Those earning more than 300,000 yuan a year reported net gains. We get a glimpse of the upper tier's confidence from sales of luxury items: High-end autos are doing well, and Chanel, Louis Vuitton, and other brands raised prices this year.

This has happened in part because China's fiscal stimulus is different from that of the U.S. Beijing feels it has more control over businesses than consumers, so it stimulates the economy by building new bullet trains and 5G telecom stations. There are no equivalents to the \$1,200 check from Uncle Sam, or the \$600-per-week enhanced unemployment benefit from the Treasury Department. China went for trickle-down economics.

The country's decision to aid business owners rather than workers may have long-term repercussions. Of its



442 million urban workers, more than one-third, or 174 million, are migrants. They mostly work in low-paying jobs in construction, delivery, manufacturing, and restaurant services. When those industries were shut down, migrants not only lost their jobs but also failed to collect unemployment checks. With their *hukou*, or permanent residency, tied to the rural areas, in Beijing's books they were never employed in the cities in the first place. They were just going home to farm.

The economic loss borne by the poorest 60% could be as much as 1.35 trillion yuan (\$198 billion), estimates Gavekal Dragonomics, a research firm. Some continue to be underemployed. In August, sales from the catering industry, which employs about 12 million migrant workers, were still down 7% from a year earlier.

China's urban unemployment rate has come down to 5.6% in August from February's 6.2% high, the statistics bureau proudly proclaimed. This figure is likely a big understatement. Migrant workers are hardly present in the government's urban survey.

Make China a cautionary tale for Washington. If the political impasse over stimulus continues, the U.S. will end up in the same situation, with the wealthy wondering whether work from home means they should sell their Hermès ties while the poor scramble to survive. A K-shaped recovery is worse than a U- or W-shaped one. **B**

—Ren is a columnist for Bloomberg Opinion



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