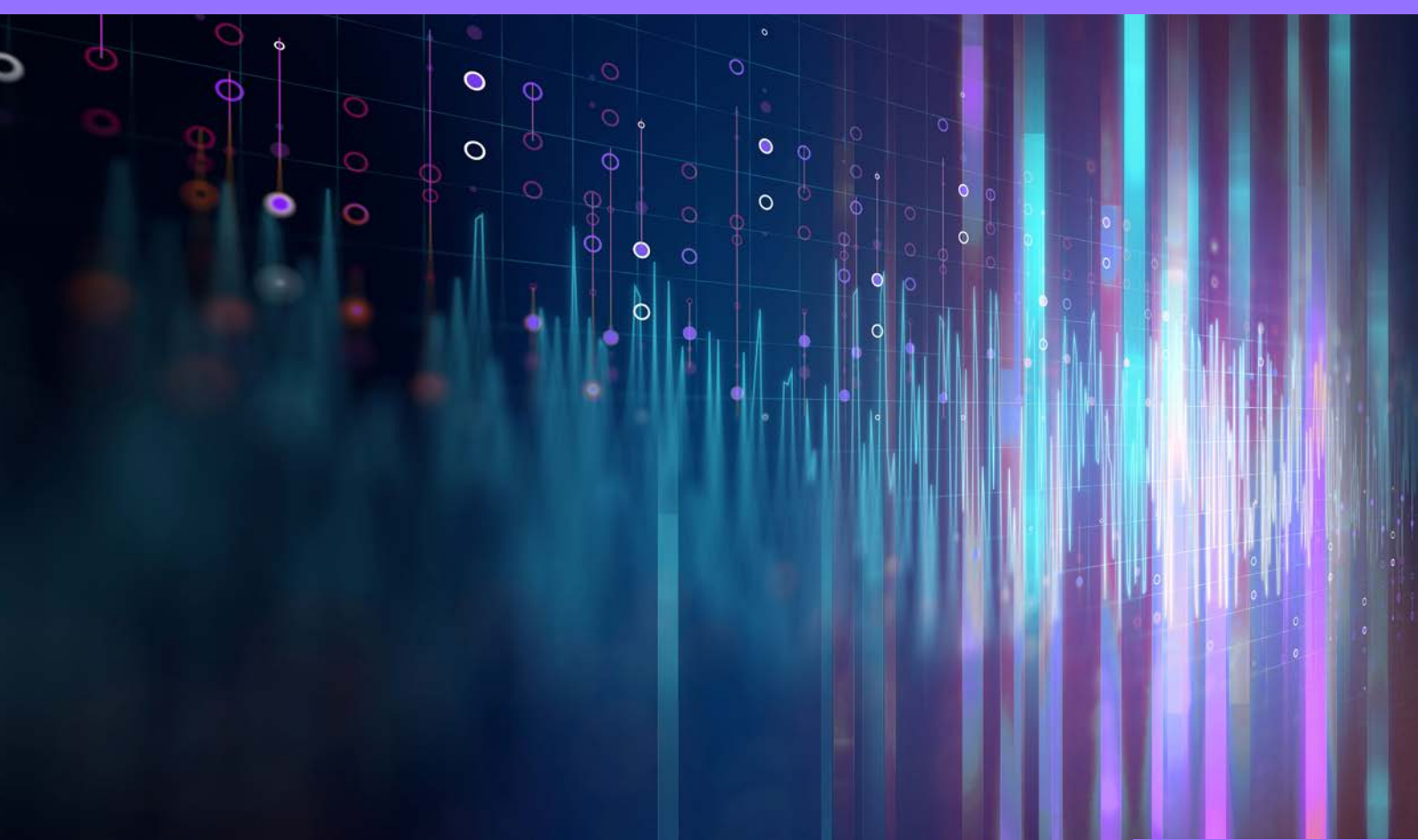


How Public Sector Agencies Can Use Analytics to Lead Through Crisis



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At every public sector agency, leaders are expected to make decisions based on what's best for individuals, families and communities. Following this imperative, leaders in the public sector have worked diligently during the COVID-19 pandemic to improve outcomes for those they serve. Analytics supports these leaders in making tough decisions by enabling them to act based on evidence - that is, data. Through analytical insights, leaders can be confident that their decisions will deliver the best possible outcomes.

Not surprisingly, the same kinds of analytics used to respond rapidly to a crisis such as the COVID-19 pandemic can also help us recover from its devastating impact. And in digging out of the devastation, analytics supports the new landscape we will encounter - helping us to imagine new possibilities and implement the policies that will be needed to prevent or mitigate a future disaster.

Addressing COVID-19: A Phased Approach

As of May 2020, more than 300,000 lives have been lost to the coronavirus, with millions of cases confirmed globally. While the numbers will increase, we will likely not see deaths at the levels originally predicted. This is a direct result of the evidence-based guidance provided by regional and national political leaders and health experts - along with the courageous, life-saving efforts of health care workers.

Early on, some public health agencies, governments and their private counterparts used analytics to reduce both the spread of the virus and its deadly impact. As people followed social distancing guidelines, "stay-at-home" orders and other evidence-based health policies set by various national, regional and local officials, some of the dire effects of the virus were mitigated.

One way governments can address the devastating effects of this pandemic is to evaluate the types of decisions and actions they need to take based on a framework that's built on a three-phased approach: respond, recover and reimagine. This framework can help you mitigate COVID-19 disruptions by enabling you to focus on and evaluate specific issues over time, rather than being overwhelmed by trying to do it all at once.



Responding to COVID-19: The phases of disruption

To effectively mitigate the disruptions caused by COVID-19, focus on and evaluate specific issues over time, in a phased approach.



PHASE 1: RESPOND

Situational awareness. Assess situation, understand what's happening, collect data.

Mitigate disruption. What can I control, and how?

Optimize supply chains. Get what's needed to keep doors open, lights on.

Maximize resource capacity. Adapt to doing more with less to meet critical needs.

Phase 1: Respond

In the early stages of a crisis, it's critically important to be able to accurately understand and assess the current situation. This is known as situational awareness, which in large part is made possible by analytics. For example, analytics is behind the various dashboards used during COVID-19 news reports and government briefings. These dashboards help agency leaders quickly locate hot spots, identify trends in the virus progression, and send critical resources where and when communities need them.

Beyond situational awareness, public sector agencies have applied analytics to respond effectively to many of the challenges raised by the pandemic.

- **Medical resource optimization.** Public and private hospitals have used advanced analytics algorithms to optimize the effectiveness of limited medical resources, such as hospital beds, ventilators and personal protective equipment (PPE).
- **Demand-planning stability.** National supply chains in some countries have been analyzed to ensure demand-planning stability and to identify critical chokepoints for necessary supplies, like food and medicine. These same supply chains can be re-engineered to eliminate chokepoints by finding different avenues for obtaining the supplies.
- **Social benefits delivery.** Social service agencies and governments at large use analytics to determine eligibility and deliver social benefits. This ensures that direct cash payments quickly get into the hands of those most in need.
- **Skills gap assessments.** Workforce analytics helps agencies determine which skills they lack so that they can fill gaps and be better positioned to respond to various aspects of the pandemic.
- **At-risk population protection.** Law enforcement and social service agencies harness analytics to support vulnerable populations who are more at risk of harm during a crisis. Integrating data from law enforcement, criminal justice, health care and other

systems of records, case managers and law enforcement officers can identify changes in circumstances that increase likelihood of risk. Then they are better prepared to assist potential victims of domestic violence, and dependent elders or children at risk of abuse.



Contact Tracing: How It Works, How SAS® Can Help

Contact tracing is helpful in identifying people who've been exposed to someone infected with a communicable disease. Once aware of their exposure, people can isolate themselves and watch for symptoms. But the rapid, global spread of COVID-19 made it clear that traditional methods were lacking.

Through data visualization and analytics, public health officials can uncover insights from contact tracing and publicly available health data to better understand:

- Missing or unexpected linkages.
- Who should be tested.
- Where the virus is spreading.
- Which communities are at greatest risk.

Quick Tips: How to Respond in a Crisis

The examples described earlier illustrate how public sector leaders have applied advanced analytics to improve outcomes for the people they serve. Every function or activity your agency undertakes can be a candidate for applying analytics to make better, faster and more cost-effective decisions. But in the middle of a crisis, you shouldn't try to reinvent the wheel. You should start with the data you have, then use analytics to transform that data into insights to inform your decisions and actions.

Consider taking these steps during the respond phase of a crisis:

- Identify the decisions that would most improve outcomes for your communities. Ask:
 - How many more beds do we need to take care of patients?
 - How do we provide medicine, or meals, for individuals who can no longer get them?
 - How will we know if someone under our care is at risk?
- Review all the types of data in your operational systems that support those decisions. Ask:
 - Where does the data reside?
 - Do we have easy access to the data, and what format is it in?
 - Can we combine this data with other relevant data from internal and external systems?
 - Who can help us access, integrate, clean and prepare the data for analytics?
 - What are the relevant privacy guidelines?

- Assemble the right team to make full use of all your data sources. Ask:
 - Who are my agency experts?
 - Which people are most familiar with the data and the systems?
 - Who is skilled with analytics and can help us identify the “quick hits” we should address first - the things that make the most difference?
 - Do we have the skills we need in-house, or do we need to look for outside expertise?



PHASE 2: RECOVER

Plan for recovery. With an eye on the future, take steps now to strengthen your agency.

Phase 2: Recover

When countries and localities are ready to move from crisis response to crisis recovery, it's essential for government agencies to use their full suite of analytics techniques. Initially, analytics helps governments decide when - and how - this transition should be made. Then they can plan for how they're going to recover, with an eye toward the future.

After lockdowns, some governments have developed guidelines for “opening up” their economies based on metrics related to the coronavirus. These metrics can be predicted using analytics. Situational awareness is one of the tools you can use to develop trending of those key metrics.

As a public sector agency leader, you should follow the trends in these metrics and begin planning well before your region is in full recovery mode. While these activities may not be as urgent as the activities taken during the respond phase, they are vital to recovery and to the continued health of your communities and economy.

The recovery phase is the time to delve into all the issues the crisis created - determining how to address immediate needs while making plans for rebuilding.



Five Areas for Agencies to Address During Recovery

As you move into the recovery phase, you'll want to anticipate and explore all the destruction the pandemic created for your agency and broader public. Doing so will help prepare you to rebuild for the new landscape. We'll look at five areas that many public sector agency leaders will need to address.



Fraudulent Applications for Benefits

Unfortunately, criminal networks will continue to operate during and after the pandemic, just as they did before. While COVID-19 is a once-in-a-lifetime challenge for most people, it has created a once-in-a-lifetime opportunity for fraudsters.¹ But social services and law enforcement agencies can be prepared for these situations. Fraud prevention analytics accurately identifies and alerts for unusual or suspicious activities, helping agencies limit the impact of criminal efforts.

For example, social services and welfare agencies can use analytics to detect fraudulent activity in applications for recovery benefits. Social network analytics paired with anomaly detection and machine learning techniques can quickly pinpoint fraud for investigators - so they can collect the evidence needed to prosecute fraudsters. These efforts preserve funds for those who truly deserve them.



Economic Recovery

Economic recovery analysis is a large umbrella of activities that uses analytics to support recovery efforts. Banking expert Joan McGowan of SAS has explored how banks have a responsibility to respond to their customers' needs and should apply "dynamic data analysis with heart."²

During the respond and recovery phases, government financial regulators play a pivotal role in ensuring the robustness and stability of the financial system. They can:

- Continuously analyze banks' financial data - specifically capital and liquidity - to assess their health and resilience to withstand the severe adverse economic scenario caused by COVID-19.
- Conduct ongoing tracking of COVID-19 cases, and regional and national effects on financial institutions' balance sheets.
- Identify banks at risk of future distress, based on a wide range of analytical methods - forecasting, econometrics, predictive modeling, etc.
- Provide analytics-based regulatory and supervisory guidance to financial institutions during the ongoing COVID-19 situation.

Financial regulators can predict and help mitigate the risk of bankruptcies for financial institutions under their authorities using risk-based analytics. And certain government agencies responsible for various economic sectors can use analytics to augment their existing efforts during recovery.

¹ Yahoo! Money. [Coronavirus stimulus checks: Scammers are trying to swipe payments.](#)

² Finextra. [Smart Decisioning and Empathy in the Face of COVID-19.](#)



Economic and Workforce Development

In times of crisis, the need to ensure economic and workforce stability is paramount. Public sector agencies, usually employment agencies, can support people re-entering the job market by using analytics to quickly and efficiently match jobs with skills.

For example, employment agencies can apply text analytics to the unstructured text found on job sites to identify key skills and match those with unemployed people. And they can incorporate nontraditional data sources to improve results. One way to do this would be to use geographic data to determine how travel time for specific jobs could uncover better employee-to-employer matches at an individual level. At a regional level, agencies can use modeling and scenario testing to forecast constantly changing impacts and establish future program direction.



Revenue Impact and Financial Transparency

Public sector agencies that have predicted changes in their funding based on reduced economic activities can use analytics to prioritize projects that will have the greatest effect on their constituents. For example, departments of transportation that have identified decreases in fuel tax revenues due to reduced driving can begin to prioritize those projects that will have the most impact over specified periods of time, such as the next three, six and nine months.



Long-Term Societal Implications

As recovery efforts continue, we'll start to see a clearer picture of the toll that close quarters, loss of life and unemployment have had on the most vulnerable among us. Experts expect to see:

- Increased numbers of people addicted to opioids.
- An increase in the risk of child abuse.
- A heightened need for the social safety net in general.

All of these should be tracked and analyzed as we move into recovery. Analytics applied to the data from the systems tracking these vulnerable individuals and families helps alert case workers and law enforcement officers before the risk is realized.

Quick Tips for How to Manage in the Recovery Phase

In the world before the pandemic, you were probably inclined to go slowly and carefully before implementing a new idea. You built a proof of concept so your team could show senior management that the idea worked. You felt that you only had one chance to do this, so you wanted to get it right and make sure your concept would be successful before you moved forward.

Today, things are different. As Accenture leaders Athina Kanioura and Fernando Lucini said bluntly in a recent Harvard Business Review article: "A Radical Solution to Scale AI Technology."³ This advice has never been more relevant than in the recovery phase of a crisis.

³ hbr-org.cdn.ampproject.org/c/s/hbr.org/amp/2020/04/a-radical-solution-to-scale-ai-technology

These leaders found that IT and business leaders often made the mistake of focusing too much of their time proving that an AI project would work rather than determining what was needed to make it work operationally. To address the immediate problems brought on by the pandemic, you and your teams need to be able to quickly scale AI projects in the real world to maximize the benefit.



Success Without Proof of Concept

Accenture recommends three key strategies to achieve success without a proof of concept:

- Pivot to piloting. Take the analytics capabilities and launch, but on a smaller scale.
- Commit to action. Focus on just one or two of your biggest challenges and devote your team's expertise to those. That way you won't have to spread your focus around too many different projects.
- Make sure the right team is in place. Kanioura and Lucini stress the benefit of collaboration across both IT and agency leadership so that there will be a mutual understanding of the desired outcome.

During recovery, some agency leaders may realize that they don't have the analytics expertise they need in-house. A collaborative team augmented by analytics experts can make the difference between simply planning to apply analytics during the pandemic recovery versus applying analytics successfully. And that is a meaningful difference. Kanioura and Lucini share that only 16% of C-suite executives have moved beyond the experimentation stage - and they achieved nearly three times more return on AI investments than their lower-performing counterparts.

As you move from the recover to the reimagine phase of disruption caused by the pandemic, use what you've learned along the way to change how you set up your analytics infrastructure. You can also call on proven, outside experts to help. Moving quickly to operationalize analytics will be much easier if you have a solid analytics foundation in place.

Phase 3: Reimagine

Beyond the "hindsight is 20/20" response to the coronavirus, many of us are convinced that our lives and livelihoods will be different after COVID-19. Some changes in the way individuals live and work - and the way communities operate - will be readily apparent. But other changes won't be seen or understood for months or even years. Governments will certainly have a pivotal role in responding to those changes. Most important will be how governments use new and reimagined policies to improve outcomes for people living inside their borders - citizens and non-citizens alike.

Public sector agencies can use techniques such as forecasting and predictive analytics to identify changes in behaviors and determine the most appropriate way to respond. This is an extension of efforts made during the recovery phase. In this capacity, analytics supports agency missions and the general outcomes that would be expected.

"Kill the proof of concept. Go right to scale."

– Athina Kanioura and Fernando Lucini, Accenture. Harvard Business Review.

Analytics Supports Agency Missions: Two Examples

- Transportation departments (and ministries) may find that the trend of driving less extends well past the end of stay-at-home guidelines. If this happens, these agencies must respond to decreased revenues and work more efficiently to serve their public.
 - Analytics predicts these changes and identifies essential projects to fund using remaining budget.
- If history predicts the future, the pandemic is likely to make people more frugal. Rather than resuming pre-pandemic spending habits, many will spend less than before - on things such as travel, dining out and buying new clothes. The pandemic has reduced economic confidence and income - while adding concerns about the safety of being in crowds, where spending tends to occur.
 - Economic models will need to be adjusted to account for these new spending trends.
 - Cross-agency collaboration - supported by cross-agency data sharing and a platform for analytics - enables better decision making that's aligned toward a common goal.

When thinking of how the public sector can reimagine analytics, two primary areas come to mind where analytics can add significantly more value. At the agency level, you can:

- Reinvent the use of analytics within current mission parameters - including, but not limited to, being prepared for a similar health pandemic in the future.
- Redefine your agency's mission, if needed.



PHASE 3: REIMAGINE

Future-proof the agency. Prepare for the next crisis.

Reinvent Analytics Within Current Mission Parameters

Some agencies already use analytics to support their current work and mission - others are still evaluating these techniques. In the reimagine phase of the pandemic's disruption, it's time to rethink how and where you use analytics in the course of your decision-making processes. Perhaps you can incorporate new types of analytics - or use the same analytics in new ways - to address pandemic-related issues. Some of this time can be spent determining how your choice of analytically driven decisions could prevent severe disruptions during a future crisis.

Let's look at examples of some of the ways you could reinvent the use of analytics.

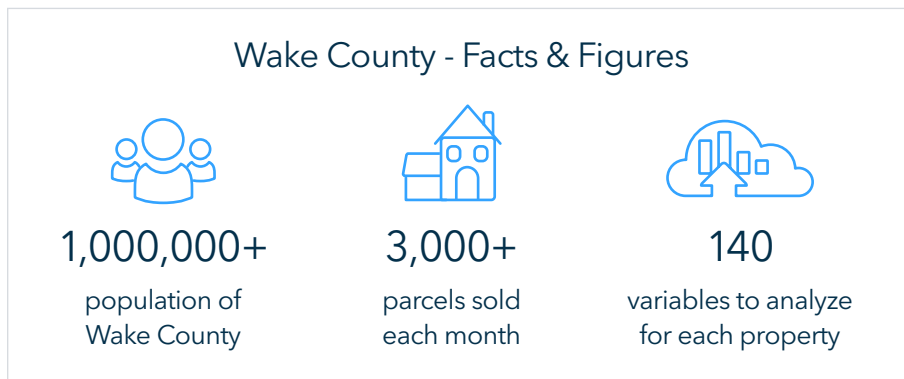
Imagine if you could significantly reduce child safety risks and threats of domestic violence

With additional data collected during the pandemic, social welfare and law enforcement agency leaders can get a better understanding of the risks that members of vulnerable populations face. Augmenting this data with unemployment data and other demographic data could help to identify risks sooner. Using analytics-based alerting for social workers and law enforcement officers could be a critical reimagination of this area.

Many agencies that already use analytics could benefit from adding different types of data to their analysis. Using data from multiple sources in combination with AI techniques (such as machine learning) could help workers understand the big picture - so they could assess risks and address problematic issues faster.

Imagine how you could reduce time out of the office and make existing employees more effective

The introduction of AI techniques (like machine learning algorithms) will be critical during the reimagine phase of COVID-19, in large part because of the efficiency such methods offer. Consider Wake County, NC, for example.



Long before the pandemic struck, Wake County's population was growing rapidly and the staff experienced tremendous strain. They also faced a shorter reappraisal cycle - instead of having eight years, they would have only four years to assess approximately 400,000 properties. There was no way to hire and train enough appraisers and support staff to get the work done quickly and accurately.

SAS built cloud-based, machine learning tax assessment models for the county that consider hundreds of factors and daily property sales to offer timely, objective, highly accurate market forecasts. With every home sale, the model is automatically refined to become more precise. County appraisers first perform their own analysis and determine values for each property, then turn to SAS for an objective second opinion. Using this approach, Wake County achieved its goal of providing fair and accurate assessments without increasing staffing or operating budget.

Imagine taking an analytics project from inception to implementation in one-fifth of the usual time

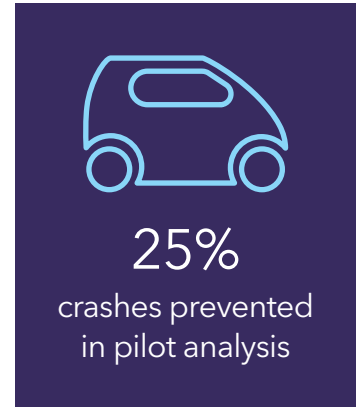
In Western Australia, the Road Safety Commission used AI to change the manner and speed at which the team works. This is another example of a public sector agency employing foresight prior to COVID-19.

This group's mission is to improve road safety, which helps reduce fatalities and serious injuries. As with most developed countries, crashes at intersections make up almost 50% of all road accidents. The commission's data and intelligence team needed to identify where to place red-light speed cameras, a proven way to prevent these crashes. Previously, the team manually ranked road intersections using killed or seriously injured (KSI) statistics. They pored over historical crash data in Microsoft Excel. Some data they analyzed, such as vehicle information, was held by other agencies.

Using a cloud-based SAS solution, the team rapidly developed a prototype of a machine learning model to produce a probability of KSI crashes. The model assessed intersections by risk, not by crashes. The complete analytics life cycle for a project - from data engineering to data visualization - dropped from 100 to just 20 hours. A test scenario using the machine learning method estimated a 25% reduction in crashes compared to the previous method.

Redefine Your Agency's Mission Through Analytics

The pandemic has shown that a small government or loosely federated government approach is severely limited in dealing with large-scale crises. After the pandemic, experts say many people will see that government can help in a way that private industry cannot. Based on what they've learned from dealing with the pandemic, governments are likely to redefine some of their mandates. Analytics supports these efforts.



Know What Your Constituents Want

Analytics helps political leaders and civil servants understand what their constituents truly want. Start with analyzing unstructured text from social media and surveys, then follow up by analyzing constituent behaviors.

Retailers and consumer packaged goods manufacturers have done this for years to determine what consumers want. It's time for governments, at all levels, to use analytics to better understand their public.

The difference, of course, between private industry and the public sector will be the guidance you must follow to protect privacy. Fortunately, you can use data management and analytics to anonymize individual behaviors and cluster those behaviors into groupings so that individual behaviors or personally identifiable information can't be discerned.

Imagine if multiple agencies could share data and unleash new opportunities to achieve goals

Collaboration across local, regional and national agencies is another opportunity to use data analytics to improve outcomes. This cross-agency collaboration takes on new meaning when data from different agencies is shared to create new insight. For example, using data provided by the Ministry of Transport, the Environmental Protection Agency can analyze how changes in automobile, rail and aircraft usage will affect pollution levels.

Imagine if governments protected everyone during crises, while working to prevent future hardships

Government leaders have a moral obligation to prepare us for future crises better than we were prepared for COVID-19. Every country has this new mandate. The 2019 Global Health Security Index measured the state of health security around the world.⁴ Their first recommendation was that “no country [was] fully prepared for epidemics or pandemics, and every country has important gaps to address.”

Preparedness extends beyond critical health care needs into overall well-being. In the US, for example, the May 2019 Federal Reserve’s Report on the Economic Well-Being of US Households reported that 40% of US adults lack the funds to handle a \$400 unexpected expense. This information has been known for years, but many people did not fully understand the consequences of this situation. The COVID-19 pandemic has illuminated this financial insufficiency in ways that all of us can see.

Public Sector Leaders Need Analytics Now, More Than Ever

Reimagining the world after the COVID-19 pandemic seems difficult to do, especially if you’re still in the middle of responding to the crisis. Sadly, some will not survive the pandemic to reimagine the world. Others do not have the luxury of thinking beyond their day-to-day existence because of their circumstances. But for some of us - especially those in public service - reimaging is not a luxury; it is a necessity.

Going back to business or policies as usual, while knowing the havoc that can be wrought by a global health crisis, is irresponsible. And one of the most important measures of a government is to be responsible.

As a public sector leader, your responsibility extends to using all available data to make evidence-based decisions that improve outcomes for the people under your care. This is true whether you’re a public policy leader charged with developing and implementing health policy, or administering social welfare benefits, or keeping transportation infrastructure operating efficiently. And it’s true for all the other ways governments operate to serve their citizens.

⁴ ghsindex.org

Reimagining requires public sector agency leaders to analyze the risks of the innovations and altered policies they choose to pursue in the interest of the individuals, families and communities under their care. But it's essential to give equal attention to the risks that would arise from making no changes at all.

The respond, recover and reimagine framework can help you address the complexity of issues that emerge during and after a crisis - and, ideally, before the next one. With an analytics-based strategy to guide your decisions, you can more effectively assess and mitigate risks, reduce fraud, waste and abuse, improve worker and agency efficiency, and encourage and reward behaviors that will benefit society. In many cases, you'll be able to do it in a fraction of the time it would take without analytics.

Imagine the difference that could make for the people who trust you to shape a world that will be safer, fairer and much more prepared for whatever the future may bring.



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