



Promoting workplace safety in the era of COVID-19: keeping employees, their families and communities healthy and safe

The COVID-19 pandemic has forced a national mobilization of resources and human capital perhaps not seen since the end of World War II.

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Countries around the world have struggled to contain the first wave of the pandemic, some with more success than others. The fragmented nature of the US healthcare system has not made our response easy and the lack of coordination and competition between government institutions and private entities for scarce resources has been highly challenging.

This is why Tyson Foods, which has been at the forefront of these issues, enlisted expertise from across the healthcare spectrum, from organizational medicine specialists, to virologists, immunologists, leaders in infectious disease and epidemiologists, to work urgently to help protect its employees and safeguard the part of the global protein supply it manages. Tyson believes it is equally critical to share what it has learned and continue to support the collective growth in understanding of how to manage and ultimately defeat this deadly threat to human wellbeing so all Americans can feel safe at work and at home.

As part of this effort, Tyson convened a scientific working group in August, 2020, to examine what we have learned about this powerful disease. Group members included:

- [Dr. Daniel Castillo](#), Matrix Medical Network
- [Dr. Scott Cherry](#), Axiom Medical Consulting
- [Dr. David Acheson](#), The Acheson Group
- [Dr. Harry Hull](#), Former CDC, WHO and State of Minnesota Epidemiology and Infectious Disease Specialist
- [Dr. Margje \(Marthe\) Haverkamp](#), Alvarez & Marsal

The first meeting of this occupational safety scientific working group covered a wide range of subjects but focused on the critical areas of testing and tracing, social distancing in the workplace, airflow and personal protective equipment, the promise and potential limitations of a vaccine and communications to and between workers about how to protect themselves. The panel also discussed new areas for research prompted by the gaps in our current knowledge.

Testing and Tracing

Testing remains critical and, to some degree, the most controversial aspect of the battle against COVID-19. The panel focused on the use of viral detection tests rather than antibody tests as a tool to understand and control risks. The United States has struggled more than many other countries to increase the number of tests to the level experts have recommended. According to the Johns Hopkins Coronavirus Research Center, the U.S. has recently achieved an average testing rate of 206 per 100,000 with approximately 750,000 total tests per day in August, but this falls significantly short of most of the daily testing levels recommended for the current infection rates. In the spring of 2020, a Harvard study group looked at three scenarios to estimate desired testing levels:

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Using the standard susceptible-infected-recovered model (SEIR)

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Daily testing estimate: 1-10 million

Using an “equilibrium model,” calibrated to protect hospital capacity

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Daily testing estimate: 4 million

Using the experiences of Taiwan and South Korea, two countries that have had success in controlling spread, to calculate a “best case scenario”

—
Daily testing estimate: 3 million

As the US has ramped up testing, however, capacity constraints quickly emerged, both in terms of lab staffing, and a shortage of machines and supplies. In August, the country’s largest testing labs reported delays in obtaining results as long as a week or more, far longer than the 48 hours recommended by experts.

In addition to the question of testing frequency, the panel raised the question of what we are actually learning from the testing itself. The panel reiterated that tests only tell you the status of viral infection at the time the test was undertaken. While the experts believe that culturable (and, therefore potentially communicable) virus is being detected in the first 1-9 days after infection, there is an open question about the importance of the residual virus captured by testing in the period after 9 days. The degree of infectiousness of someone with residual virus that is not culturable has not been conclusively determined.

Testing Sensitivity/Specificity

A complicating feature of the testing landscape has been the emergence of faster, high throughput, testing technologies. While they suffer from lower sensitivity than rt-pcr-based tests, this shouldn't present a problem now that testing levels have risen to the point where false negatives can be corrected in repeat testing. However, the panel was concerned about the potential problem of low specificity in newer tests due to the fact that lower specificity can result in an increase of false positives, distorting the accuracy of system-wide reporting and causing unnecessary distress for individuals and their families. This critical and not widely understood distinction is something the panel believes Human Resources executives need to be educated about in order to give accurate information to employees being tested. Knowing the limitations of the testing tools being used is important.

Testing in the Workplace & Communities

An additional testing challenge has been the fragmented nature of state and county responses to infections within an employee population, with health departments adopting radically different standards for workplace shutdowns. At the same time, the level of community testing in some regions has been markedly lower than testing in workplaces, creating a misleading picture of the possible sources of spread.

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The scientific working group also pointed to the fact that the level of testing is of little significance without a consistent plan for how to handle people who test positive for COVID-19. This is a question that employers and school districts have

continued to struggle with. Having tested nearly 30 percent of its workforce, Tyson itself has now established a strategic testing protocol by which a statistical sample of team members in the thousands will be tested weekly across all of their facilities. This process will help identify those who are infected but asymptomatic. Those who test positive are required to self-quarantine while the company carries out a rigorous contact tracing process.

Vaccination in the Workplace

The availability of an effective vaccine providing immunity against sars-cov-2 will have a significant impact on workplaces with dense working conditions but is not, by itself, a silver bullet. All of the current protective measures – social distancing, screens, masks and shields, airflow management – will still be required. There needs to be continuous education for employees and their families to ensure this is well understood.

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This is important to emphasize, according to the panel, because too little is presently known about the level and duration of immunity a vaccine will provide and it is also unclear what penetration of vaccination will provide herd immunity. This is especially critical in light of the anticipated level of vaccine resistance, not

solely from established “anti-vaxxers” but from people who are unnerved by the speed with which the vaccine may be brought to market. In this context, companies need to determine their legal ability to mandate vaccination for all employees (and the wisdom and other challenges of this approach) in order for them to be allowed to come to work. The panel pointed to established precedent in the mandatory vaccination of hospital workers for MMR and influenza but recommended that companies seek legal clarification on this question. The question was also raised about how one might ensure high levels of vaccination in the community in parallel to the workplace, pointing to the need for much higher levels of public/private partnership in order to create safe communities and safe workplaces on an ongoing basis.

Mobilizing Private and Public Partnerships

The unprecedented impact of the COVID-19 pandemic has also exposed, as nothing previously, the gaps in our ability to orchestrate an integrated response from public and private entities. The lack of coordination and information sharing between companies and county, state and federal officials that afflicted the early response has taught an important lesson that productive engagement needs to be put in place prior to the next wave of COVID-19 or a new pandemic. Establishing memorandums of understanding in advance about roles and responsibilities, ensuring that corporate resources can be put at the disposal of cash-strapped local health departments and establishing shared goals to the right level of detail will go a long way to ensuring an effective response. This preparation could, in the future, include regular annual reviews and tabletop drills to help maintain readiness. This kind of mobilization was standard in the Cold War era and following September 11 and should be reinstated, the panel suggested. Such a coordinated response will help alleviate some of the challenges large corporations face when trying to implement programs across multiple jurisdictions, each of which may have different requirements.

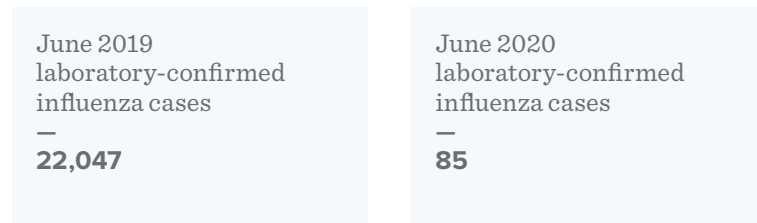
Education & Behavior Change

Organizations like Tyson Foods who are part of the critical infrastructure and that have been instructed to continue operations consistent with CDC and OSHA guidance throughout the pandemic, have also learned that employer-sponsored education about how to stay safe is critical but this cannot be limited to what takes place within the physical and temporal parameters of the working day. The risks of infection are present both inside and outside the work environment, so no matter how effective the educational materials are or how frequently safe behaviors in the workplace are reinforced, if employees don't carry safe behaviors into the rest of their lives, workplace education can achieve little. The impact of effective education is only as good as the engagement and practice of employees. This means carrying workplace safety practices into their personal lives and

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using social distancing, handwashing and mask wearing in every context whether in the home, at religious services or when socializing. In order to achieve this goal, companies with multi-lingual employee populations need to translate educational materials and find ways to communicate safety messaging in culturally appropriate contexts, such as through messengers from the same cultural backgrounds as the employees themselves.

The panel also observed that the COVID-19 pandemic presents an opportunity to create long term behavior change in two areas – respiratory pathogens and chronic diseases such as diabetes, hypertension and cardiovascular disease. As plummeting influenza levels in the Southern hemisphere have shown, health behaviors being used to address COVID-19 have already been proven protective against other respiratory diseases. Australia’s National Notifiable Diseases Surveillance System, for example, recorded only 85 new laboratory-confirmed cases of influenza in the last two weeks of June, 2020 – a stark contrast from the 22,047 confirmed cases recorded during the same time last year.



The hope is that behaviors such as mask wearing - little used in the past outside Asia - will be retained in other parts of the world even after the pandemic is gone. Similarly, it would be highly significant if the correlation between chronic disease and the worst COVID-19 outcomes led larger segments of the world population to do a better job managing their weight, eating healthily and getting exercise on a permanent basis. The improvement in human health and the reduction in the cost of healthcare globally would be sizable.

Future Research Needed

As the panel made clear, there is an enormous number of unanswered questions about COVID-19, notwithstanding the immense level of effort around the world to get the right answers. Panelists emphasized that it is critically important to ensure that further research be done not just in the lab, but in real-world settings, such as industrial facilities, especially in those in which work is being done in confined quarters. Several specific studies were proposed to assess:

Another study that might be conducted within a real-world industrial environment could help answer the difficult question of what constitutes an infectious dose, as opposed to background measurement of viral presence. The study could also help establish how far the virus travels from an infected worker and by looking at the viral genome within a specific plant could help determine the epidemiology of an outbreak.

- What is the safe level of air exchange per hour in a processing plant and what is the exact impact of differing temperatures and humidity levels?
- How far do small and large droplets actually travel in a processing plant?
- The current belief is that face masks and shields are protective, but what percentage of infections, if any, might be coming through the eyes?

Another study with an identified population within a specific workplace could be done to evaluate testing strategies. If the workforce were administered a viral antigen test three times a week with a control group receiving the highly sensitive qrt-pcr test, that would be another way to identify the hard-to-measure infectious dose and establish the relevant cycle threshold. Currently, most tests set the limit at 40, but some experts believe that a threshold of 35 or even 30 would provide a more reliable guide to who was contagious, as opposed to merely carrying genetic fragments. The expansion of rapid testing might help overcome this problem by making it possible to test rising viral loads within a short period of the initial test, enabling us to catch the most transmissible individuals and allow others to remain active in the workplace.

Crucially, an industrial facility could also serve as a testbed for vaccine efficacy. If the whole workforce was to receive the vaccine at a defined time, it would be possible to assess:

- The level of vaccine efficacy
- The duration of the protective effect
- Potential spread from worker to nearby worker
- Whether vaccinated individuals can or cannot shed virus even if protected from the disease
- Reinfection rates

Another interesting possibility is to use the “closed loop” of a small community housing for an industrial facility to track the epidemiology of an outbreak by sequencing the virus genome in cases in that community. This would answer questions about the relationship between workplace transmission and community transmission, which is still not clearly understood. While genomic sequencing has up to now been time consuming and complex, newer methods such as nanopore technologies can provide answers in 3-5 days making such a community experiment possible for the first time. Such a community/workplace setting would also, according to the panel, make it possible to study the efficacy of a vaccine when it becomes available. Only by conducting real world research of these types will we get the kinds of information to help us with the long-term management of a contagion that is likely to endure.

Conclusions

As several members of the panel observed, we should not have been surprised by the arrival of sars-cov-2 and we should assume that it will not be the last virus to make the leap from wild animals to human beings. Only time will tell whether this virus fades away or becomes, once an effective vaccine is in use, a regular threat to manage such as measles or influenza. Regardless of the path it chooses, it is clear from our experience with the pandemic so far that commercial organizations, no less than public entities, need to be actively engaged seeking better insights about the way the virus works and finding innovative ways on how to handle the pandemic in the workplace and in the community.