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KIMBERLY MAXSON-RUSHTON
EMAIL: krushton@cooperlevenson.com

FILE NO.

June 25, 2021

Hon. Michael Douglas, Chair
Nevada Cannabis Compliance Board
555 Washington Ave, 4200
Las Vegas, NV 89101

Re: Nevada Cannabis Compliance Regulation 11.015

Dear Chairman and CCB Members:

Please find enclosed herein proposed changes to Nevada Cannabis Compliance Regulation ("NCCR") 11.015 respectfully submitted on behalf of RSR Analytical Laboratories ("RSR").

RSR's proposed changes are in response to the draft language, pertaining to NCCR 11.015, recently considered by the CCB during the June 15, 2021 Regulatory Workshop. The proposed language is intended to strengthen the regulatory requirements relative to impartiality and further the CCB's mandate that testing labs be independent from other cannabis establishments. The proposed changes also seek to ensure that members of the cannabis industry clearly understand how the CCB construes the term "impartiality."

In brief, the language proposed by RSR specifically sets forth acts which, if committed, would constitute a lack of impartiality by an independent testing laboratory. The language also prohibits a cultivator, producer and/or dispensary from certain acts that could impact the impartiality of a testing lab in Nevada; said language is proposed in response to CCB Member Durrett's concern relative to "lab shopping." RSR's suggested language also preserves a labs ability to provide consulting as well as research and development services for clients. As evidenced by the article attached hereto, authored by RSR's Microbial Scientist, Anthony Repay, research and development within the cannabis industry is necessary and imperative to ensuring the safety of cannabis products sold in Nevada.

Correspondingly, RSR respectfully requests that the draft language currently being proposed (NCCR 11.015(2)) be removed for the following reasons: To date, no evidence has been presented by any party nor Staff demonstrating how the business practice of refunding a service fee or cost constitutes impartiality; and, the draft language in NCCR 11.015(2)(a) and (b) is ambiguous and in part redundant. Thus, RSR submits the enclosed proposed language in a good faith effort to clarify what

acts, within the cannabis industry, constitute "impartiality" and to alleviate any concern relative to "lab shopping."

Lastly, on behalf of RSR, my clients and I would like to thank the CCB for its consideration of these proposed changes to NCCR 11.015. Without question a robust regulatory scheme aids both the Board and the cannabis industry in navigating Nevada's cannabis laws. RSR welcomes the opportunity to provide further input and assistance to the CCB relative to regulatory revisions, which serve to strengthen Nevada's cannabis laws.

As always, thank you for your consideration of this matter.

Respectfully Submitted,

Kimberly Maxson-Rushton, Esq.

Enclosures

cc: R. Rushton, RSR
R. Richardson, RSR
T. Klimas, Ex. Director

Proposed Changes to NCCR 11.015

(Subsections (2)-(6)

Submitted on behalf of RSR Analytical Laboratories

(2) To be considered independent from a cultivator, producer and/or dispensary, an independent testing laboratory, including its employees, management, directors, owners:

(a) Must not have a financial or other interest, direct or otherwise, in a cannabis establishment doing business in Nevada;

(b) Must not participate, consult, or otherwise be involved in the cultivation or production of cannabis; and

(c) Must not have any other interest in or involvement with a cannabis cultivator, producer and/or dispensary that could cause the independent testing laboratory to act in a manner that is not impartial.

(3) An independent testing laboratory is not required to use a cannabis distributor to collect or transfer samples for testing.

(4) The restrictions denoted in subsection 2 are not intended to limit an independent testing laboratory, or the above listed individuals, from providing consulting services to a cultivation establishment, production establishment and/or dispensary, provided that such services do not directly or indirectly indicate, suggest, or imply how to cultivate or produce cannabis.

(5) If a registered independent testing laboratory hires a person who was previously employed by, or performed any work for, a cultivator, producer and/or dispensary within one year prior to the person's date of employment with the independent testing laboratory, the independent testing laboratory shall not permit that person to perform any tests for which the person had any involvement with, whatsoever, while the person was employed by the cultivator, producer and/or dispensary for a period of one year from the person's date of employment with the independent testing laboratory.

(6) A cultivator, producer or dispensary shall not:

(a) Attempt, directly or indirectly, to improperly influence an independent testing laboratory, or any of its employees, management, or owners, regarding any sample currently being tested by the laboratory

(b) Engage in any transaction with an independent testing laboratory it is utilizing, has utilized, or intends to utilize to test cannabis, which would require the independent testing laboratory to participate, consult, or otherwise be involved in the cultivation or production of cannabis. This restriction is not intended to limit a cultivator, producer or dispensary from engaging an independent testing laboratory to provide consulting or research and development services, provided that such services do not directly or indirectly indicate, suggest, or imply how to cultivate or produce cannabis.

Temperature Comparison of 3M Rapid Yeast and Mold Petrifilm Utilizing Manufacturer's Suggested Temperatures on Dried Cannabis Flower (Cannabis spp.)

April 16, 2021

Anthony J. Repay
Cannabis Science and Technology, April 2021, Volume 4, Issue 3
Pages: 32-34

In this study, dried cannabis flower found to have yeast and mold during compliance screening were randomly chosen to be plated at two different incubation temperatures to compare total amount of yeast and mold growth.

When using 3M rapid yeast and mold petrifilm for the analysis of dried cannabis flower (Cannabis spp.), the manufacturer suggests two different incubation temperature ranges, 25 °C ± 1 °C or 28 °C ± 1 °C. In this study, dried cannabis flower found to have yeast and mold during compliance screening were randomly chosen to be plated at both temperatures to compare total amount of yeast and mold growth. These plates were incubated between 60–72 h in accordance with manufacturer guidelines for microbial testing. Overall, it was found that all plates that exhibited growth showed higher colony forming unit (CFU) counts at 25 °C and some observed to be statistically significant in their difference in favor of 25 °C. I urge all cannabis microbiologists and state compliance boards to require 3M rapid yeast and mold petrifilm, when testing dried cannabis flower, to be incubated at 25 °C to ensure accuracy in testing and safety of the consumers.

There is such a diversity of microorganisms on dried cannabis flower (*Cannabis spp.*) that it has led us to selectively test for the ones harmful to humans. These guidelines are a pass–fail system that are regulated on a state-to-state basis, and can be set up as either a colony forming unit (CFU) threshold or through presence and absence testing (1). One area of concern for cannabis has been yeast and mold contamination of the flower through the growing and drying process. Several different types of yeast and mold have been found to find a suitable environment in cannabis production conditions through a speciation process (2). Cultivators have also now started adding different microorganisms, including fungi, to help facilitate the growth of their product in a way to be more natural in their growing situations (3). The problem stems from that some of the microorganisms, in large enough quantities, can lead to human harm if not properly tested for (1).

The overall purpose of this study is to compare CFU counts at two different manufacturer recommended temperatures to determine the optimum temperature for measuring yeast and mold on dried cannabis flower. Dried cannabis flower is defined as the crude flowering part of the cannabis plant (4). This is generally the main part of the cannabis plant that is tested. The manufacturer of petrifilm, 3M, recommends two different temperatures for the incubation period of their rapid yeast and mold product Cat: 6475/7477. These temperatures are 28 °C ±1 °C or 25 °C ± 1 °C. After reaching out to 3M their response stated that there were two different ranges because some yeast and mold organisms are better recovered at 25 °C while others grew better at 28 °C. Following this inquiry, the question was asked is there a difference between 28 °C ±1 °C or 25°C ± 1 °C for incubation temperature? Secondly, if there is a difference in temperature, which of the two temperatures would be the optimal temperature for dried cannabis flower?

Experimental

Five client samples that were found to have a total yeast and mold count under full panel compliance testing were chosen at random to be used in this temperature comparison. These samples were crushed to form a homogeneous cannabis mix in a sterile bag and transferred to the weighing area. Next, 1 g from each sample was weighed out aseptically into a sterile filtered bag to which 99 mL of sterile butterfield's diluent was added. Following that, 1 mL of this solution was transferred to petrifilm and pressed. This process was repeated 50 times on to 3M rapid yeast and mold petrifilm for each of the five samples. This was done in accordance with the instructions given by the manufacturer and Association of Official Agricultural Chemists (AOAC) recommendations (2,4,5). Petrifilm is a simple, ready to use plate system with specialized antibiotics to facilitate the growth of only yeast and mold on the plate in a rapid manner (5). These 50 replicates were then equally divided randomly to either be incubated at 28 °C ±1 °C or 25 °C ±1 °C. Following the state of Nevada and 3M guidelines for incubation, these plates were incubated between 60–72 h along with a blank and a laboratory control spike (LCS). This LCS was made from a pure culture of *Candida albicans* (NCPF 3179/ATCC10231) to confirm fungi growth can occur under present conditions. The blank was plated to confirm that no cross-over contamination occurred throughout the process. Due to client confidentiality, the names of the clients will be hidden and will be given a four-digit number to associate the sample with. These numbers are as follows: 5205, 5124, 5251, 5308, and 5166.

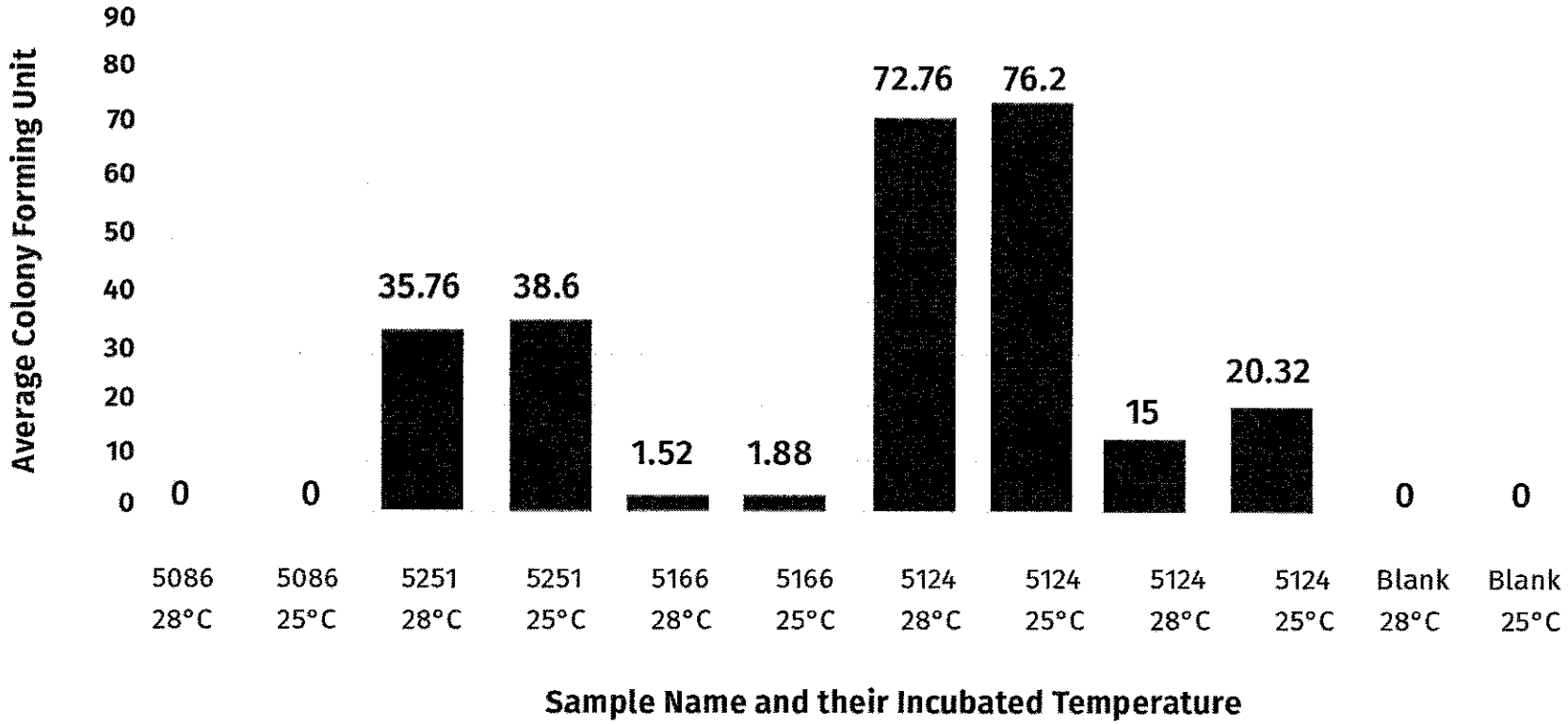
Results

CFU Count Comparison

Table I: Two-sided T-Test (df=48) of sample means. This analysis was done utilizing r statistical software.

CC No.	28 °C Mean	25 °C Mean	Difference in Means	Confidence Interval	T - Statistics	P- Value
5251	35.76	38.60	-2.84	(-4.973, -0.707)	-2.678	0.010
5166	1.52	1.88	-0.36	(-1.022, 0.302)	-1.095	0.279
5205	72.76	76.20	-3.44	(-15.658, 8.778)	-0.568	0.573
5124	15.00	20.32	-5.32	(-7.196, -3.444)	-5.707	0.000

Figure I: Averages of given samples at their respective temperature of incubation. CFU is an abbreviation for "colony forming unit." The LCS's for both temperatures came back as too numerous to count (TNTC).



Samples 5124 and 5251 CFU counts were found to be significantly different at the 95% confidence interval (Table I). Samples 5308, 5166, and 5202 were found to be nonsignificant even though the average CFU count was higher at the lower temperature (Figure 1). To determine whether a significant difference between samples existed, a two-sample t-test with df=48 was conducted, with alpha set at the 0.05 level. In all four samples that experienced growth, all difference of means were negative again showing that high counts were observed at the lower temperature recommendation. Sample 5308 showed no growth at the dilution. From this data we can deduce that the lower incubation temperature is likely more ideal for yeast and molds commonly found on dried cannabis.

Conclusion

When testing dried cannabis flower for total yeast and mold, utilizing 3M yeast and mold rapid petrifilm, 25 °C offers statistically higher counts in comparison to 28 °C. Sample 5251 and 5124 showed significant difference between temperatures at the 95% confidence interval (Table I). All samples that showed growth yielded higher counts at the lower temperature (Figure 1). Along with higher counts, colonies are easier to enumerate because of the increase in morphological diversity observed on the plates. These morphological differences mainly pertain to the shade of color of the colonies found on the plate. The remaining sample that showed no growth was determined to be plated at a dilution too high to see the true CFU count. Secondly, samples were in refrigerated storage prior to research and development for more than 30 days due to state guidelines of sample disposal. This could have also played into the lack of growth for sample 5308.

This preliminary research has areas of possible expansion in many ways. For one a selective agar, such as Dichloran Rose-Bengal Chloramphenicol agar (DRBC), could be used to compare the counts of different temperatures to a single count. Secondly, temperatures outside of manufacturers specifications could be implemented because of the complex matrix of the dried cannabis flower. This matrix specifically on 3M rapid yeast and mold petrifilm can lead to misidentification to the untrained eye due to the cannabis matrix causing a blue color to appear, but these small matrix interferences do not match the morphology of other yeast and mold (6). With continuing innovations in temperature, media, and measurement of contaminate we can hope to minimize the effect of matrix interference in the sample measurement. Ultimately, the goal is to not only supply cultivations and manufacturers of cannabis with honest and accurate results so that they can better remediate their product, but to also not allow harmful product to reach the marketplace. In late 2020, the AOAC developed a task force to evaluate yeast and mold determination in cannabis, but as microbiologists in this new industry we are responsible for validating these methods to protect the consumers of the marketplace (7). Based on these preliminary results we have identified 25 °C to achieve the most reliable growth for rapid yeast and mold petri. I urge governing bodies of cannabis and method developers to require that laboratories that utilize the 3M rapid yeast and mold petrifilm to incubate at 25 °C or to research how these temperatures may affect growth in different states. This will maximize the potential for CFU growth for samples and limit the possible health concern of allowing contaminated product to enter the marketplace.

Acknowledgements

I would personally like to thank RSR Analytical Laboratories for help fund this research, Tao Zhong for aid in sample preparation, and Wyatt J. Tarter for statistical analysis.

References

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2. A.K. Gautam, M. Kant, and Y. Thakur, *Archives of Phytopathology and Plant Protection* **46**(6), 627–635 (2013).
3. Z.K. Punja, D. Collyer, C. Scott, S. Lung, J. Holmes, and D. Sutton, *Frontiers in Plant Science* **10,** doi:10.3389/fpls.2019.01120 (2019).
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7. AOAC international Activates accelerated program to evaluate test kits that measure yeast and mold in cannabis. (2020, December 07). Retrieved March 13, 2021, from https://www.aoac.org/news/aoac-international-activates-accelerated-program-to-evaluate-test-kits-that-measure-yeast-and-mold-in-cannabis.

About the Author

ANTHONY J. REPAY, M.S., is the Director of Microbiology at RSR Analytical Laboratories. Direct correspondence to: repayanthony@gmail.com

July 6, 2021

STATE OF NEVADA
CANNABIS COMPLIANCE BOARD
ATTN: Tyler Klimas and Michael Miles
Via Email: tklimas@ccb.nv.gov; mmmiles@ccb.nv.gov

RE: CCB Requested Follow-up Information - Security and Team Driving

Hello CCB Members,

Per Board Member Durrett's request, we have reached out to known contacts in insurance and security for their perspective on the proposed amendments to NCCR 13.025(5). Our contacts concur that the two driver requirement does not pose significant benefits in terms of security. In fact, insurance companies for cannabis cargo coverage do not reduce premiums for team driving policies, and instead reduce premiums when vehicles are adequately retrofitted with security cameras, alarms, safes, and GPS fleet tracking. We have not come across a representative from any industry (outside of armed cash transport), including insurance and security, who do not agree with the intent and reasoning for our petition request to permanently waive the two driver rule from CCB regulations. Please see attached letters from Farmer's Insurance and Invictus supporting Blackbird's position. We encourage CCB to also reach out to State representatives in security to discuss security and team driving.

Blackbird also went back to what records we could for the origination of the $25,000 threshold under NCCR 13.025(5). Blackbird's CEO/Founder, Tim Conder, recalls being asked by State regulators for a dollar threshold, suggesting a value much higher than $25,000, and the final decision being walked back to this current regulation. There is no reference or correlation of the current threshold amount to our current insurance policies. The value of each transport does not affect our insurance coverage or premiums. Establishing a two driver requirement based on cargo value would be a subjective decision by the Board. Based on previously provided data, a threshold around $75,000 would be more reasonable of a requirement in terms of our labor force (requiring two drivers for approximately 15% of our transports). However, our ultimate recommendation is to repeal this threshold in its entirety because it is subjective and does not present parity with regulations from other legal cannabis markets or other distribution industries (see our June 15th Public Workshop comment letter).

Lastly, we will need further clarification on the newly proposed distance threshold. It presents significant logistical challenges in terms of figuring out when the 50 miles is reached. Is it from beginning to end of route; including all sequential picks and drops? If we break up the route for

cross-docking, do we count each mileage of each leg of the transport. Tracking distances for consolidated transports is difficult, and we don't want the end result of our petition to be more cumbersome regulation; and less internal business-driven decisions. We do not understand the intent behind the distance threshold based on all of the information provided to date; however, if we had to pick a distance threshold, something closer to the 200 mile mark would be more manageable from a logistics perspective. With this threshold, we would be truly cleared for all regional/local transports in northern and southern Nevada, and only required to have two driver agents for our long-hauls (transports generally traveling 4 or more hours).

Please feel free to reach out with additional questions and concerns. Thank you for your continued discussion and consideration on this matter.

Sincerely,

Jennifer Gallerani

blackbird

VP of Logistics

Keep it moving.

650.515.1381

www.myblackbird.com

www.blackbirdgo.com

Enclosed:

1. *Invictus Letter of Support, Matt Koetting, CEO*
2. *Farmers Insurance Letter of Support, Nick Goman, Commercial Manager*
3. *CATO (2021). The Effect of State Marijuana Legalizations: 2021 Update*
4. *BSI (2021). Supply Chain Risk Insights 2021*

CC: Tim Conder, Blackbird CEO

INVICTUS INTERNATIONAL
www.invictusops.com | 5030 S Decatur Blvd, Suite H, Las Vegas, NV 89118 | 702.629.3971

June 22, 2021

STATE OF NEVADA
CANNABIS COMPLIANCE BOARD
ATTN: Tyler Klimas, Riana Durrett and Michael Miles
Via Email: CCBmeetings@ccb.nv.gov

RE: Proposed Amendments to NCCR 13.025

Dear Cannabis Compliance Board (CCB) Members,

Invictus International Holdings LLC (DBA Invictus GS3) has established itself as an industry leader in securing the cannabis supply chain with demonstrable success in Nevada dating back to medical only regulations. Our company provides security and risk management solutions as business partners to the legal cannabis sector. Our expertise is a product of several centuries of military (with several decades in US Special Operations Forces) and law enforcement experience amongst our leadership. Our service offerings are more easily described by stating – we do not install and maintain cameras and alarms, everything else is generally or specifically within our scope. Especially secure logistics.

Notably, we have provided secure logistics service for cash assets being transported between and from licensed cannabis entities to financial institutions in the state of Nevada. Our current total is nearing 10 figures. We recognize, analyze, assess, plan and mitigate the risk of this service daily – as it is a fluid environment. Our transport team does not and will not "touch the plant" (transport cannabis products). This is a component of regulatory risk, an environment we have had to navigate while adhering to the most stringent federal requirements for cash transport in an industry that is still not federally recognized (with the exception of tax purposes) with a dedication to what we believe is paramount to our clients' safety: reducing the cash on site and in transit.

We have had the opportunity to build a longstanding relationship with Blackbird. We have consulted and advised on security measures, standard operating procedures and emergency action plans for their team. Including training managers, drivers and logisticians on robbery prevention and response. I have been vocal and emphatic with endorsing the standard operating procedure of surrendering the cargo and protecting human life in a robbery scenario. Regional and global crime trends relating to supply chains[1] and the legal cannabis industry correlate with licensed cannabis logistics[2] becoming less of a target. I would infer that the companies involved in transportation and distribution of cannabis employing best practices in the business-to-business distribution of legal cannabis present a hard target to for a successful robbery. In crime trend analysis, the most dangerous part of the on-road supply chain exists in the "last mile" of business-to-consumer or "home deliveries".

In assessing risk as a product of existing threats and vulnerabilities: requiring two cannabis establishment agents to accompany the vehicle has the unintended consequence of increasing the vulnerabilities of the operations rather than reducing or mitigating the threat. Cannabis distributors have widely adopted the best practices doctrine to surrender the cannabis and/or cash assets when met with a hostile robbery attempt. In security and risk management you can reduce a threat by countering it with greater force or mitigating it by early indication and warning (prevention by detection). Allowing manifests with insured values not exceeding $25,000 to operate with one cannabis establishment agent is historically arbitrary by crime trend analysis. Insured cargo values below $25,000 are most commonly attributed to business to consumer logistics, where the only recent robbery attempts have occurred in Nevada (targeting home delivery drivers).

In a violent crime targeting a cannabis distribution vehicle, where the propensity of the aggressor to take a life is high, the loss incident is only reasonably increased when the human asset is required to be two or more. An argument can be made that the vehicle will be more vulnerable during restroom and fuel stops, where a reasonable person may assert that a vehicle would be targeted if left unattended. Given the best practices of surrendering cargo, an unattended vehicle presents less vulnerability, by virtue of no human asset present, as opposed to a vehicle occupied by one cannabis establishment agent while the other conducts break or fueling activities. The unintended

economic outcomes of the two-agent requirement result in less training, lower wages and a higher risk of insider threat as the buyers' price tolerance for distribution solutions does not change proportionately to the costs of employing two drivers simultaneously on each leg of distribution travel. Armed cannabis transport, which I am not in favor of, is the only solution where I can consider additional agents as a reduction of risk where hostile force is countered with more lethal force capability.

My professional recommendation for the nexus of regulations should focus on the following security measures and risk management techniques:

Distribution vehicles should be retrofitted with the following security measures

1. An installed Global Positioning System (GPS) tracking unit that is active and powered on the entire distribution route and is capable of establishing the position, direction and rate of travel once in every thirty-second interval (minimum frequency).
2. Locking compartments that are not accessible by using the vehicle keys or vehicle keyless entry system. These compartments should be sturdy in design and not easily defeated by unsophisticated mechanical breach efforts.
3. Interior and exterior camera systems that offer live and remote access and cloud-based storage with redundant storage capability in the vehicle with front-facing, rear-facing, cargo and cab-facing cameras at a minimum.
4. Cellular voice communication immediately accessible by the driver.
5. Panic mechanisms either hard-wired to the vehicle or accessible via cellular or satellite communications capable of transmitting a panic message to an actively monitored dispatch center.

The following non-inclusive suggestions to Standard Operating Procedures and potentially regulatory oversight in the post-incident audit and/or periodic audit scope:

1. Failures of the aforementioned security measures must be reported to the CCB utilizing the established incident reporting requirements. A failure of any one system must be mitigated by additional temporary security measures for the duration of the failure, a failure of multiple systems constitutes an inoperable vehicle.
2. A security plan for on-road distribution operations that incorporates security measures, recovery of inoperable vehicles, on-site transfer of products, rest procedures and incident/emergency response criteria.
3. Positive communication through documented radio checks ensuring function and operability of systems during any stops which would require departure from the vehicle.
4. Licensed cannabis distributors are required to report a robbery, loss, burglary or attempted robbery or burglary to law enforcement as early as reasonably and safely possible.

Thank you for your consideration and your diligent commitment to the safety of Nevadans and our communities. Should any questions arise pertaining to this professional opinion, please contact Matt Koetting at matt@invictusops.com or 702-629-3971.

Sincerely,

Matt Koetting
Chief Executive Officer and Qualified Manager
Invictus International Holdings LLC (NV PILB 2282)

[1]BSI Supply Chain Risk Insights Report: Crime Trends in Logistics 2021. "87% of global cargo thefts from 2019 involved transport trucks, reducing to 71% in 2020" (https://www.bsigroup.com/globalassets/localfiles/en-gb/supply-chain-solutions/resources/bsi-supply-chain-risk-insights-report-2021.pdf)
[2]CATO Institute: The Effect of State Marijuana Legalizations: 2021 Update. Broad Reference (https://www.cato.org/sites/cato.org/files/2021-01/PA908.pdf)

John S. Barsanti Insurance Agency

215 Mt Rose St. Reno, NV. 89509

Ph; 775-825-1444 Fax; 775-825-2837

jbarsanti@farmersagent.com

6/18/2021

To Whom It May Concern,

With regard to the current regulations of requiring 2 drivers to be in a vehicle when delivering products in value over $25,000, and the contemplation of changing the regulation to routes with distances over 50+ miles.

There are currently no insurance rules or regulations within the insurance industry that dictates or mandates the number of employees that need to be utilized during the transportation of products/cargo within the cannabis industry. When providing Property coverage for the cargo that is being hauled the primary concerns are if there are any regularly established routes and times, if the vehicles have security (lockbox, gps, cameras) within for the cargo being transported. Insurance carriers prefer in the event of a robbery that all demands are complied with and not to resist. Typically seen within the industry when a theft occurs it is the vehicle that is compromised and stolen with the contents and employees not physically being held up. Having two employees like is typically done within the business of transporting money could possibly be more inherently dangerous as they are not allowed to be armed like other industries allow.

Best regards,

Nick Goman

Commercial Manager

Please let me know if you have any questions, or if there is anything I can do for you.

Nick Goman
Barsanti Insurance Agency

BSI Supply Chain Risk Insights Report 2021

By Royal Charter

Contents

Foreword

COVID-19 had an immense impact on shaping the way organizations conducted business in 2020, requiring new business plans, workflow processes and even alternative sourcing that exposed organizations to a host of unexpected risks. The pandemic shifted priorities and exposed gaps in business continuity plans that required companies to quickly adapt to the changing landscape of risk presented through the lens of the pandemic. Alternative sourcing similarly exposed unprepared organizations to new security challenges that were not present in existing supply chains.

However, even as the virus became the top priority for organizations, other risks to supply chains and organizational resilience continued to occur concurrently with the spread of COVID-19. The pandemic, in many cases, exacerbated extant threats to security, business continuity and sustainability. The spread of the virus shifted the way criminals operated and exposed a larger portion of the global population to labour exploitation.

It was this assortment of challenges and shifts in trends last year that will form the basis for threats that are likely to test organizational resilience in 2021. Organizations across the world are set to contend with the lingering effects of COVID-19 this year, along with chief security concerns, including cargo theft and smuggling, the economic toll of lockdown measures that in many cases, has only served to amplify social issues likely to contribute to business continuity concerns. The spread of COVID-19 last year also had the effect of increasing risks of food fraud and food safety violations in 2021.

Beyond these concerns, stemming directly from the impact of COVID-19, are other challenges that are likely to materialize in 2021. The increasing focus by governments on rooting out major labour rights violations, particularly forced labour, will likely require organizations to maintain and even expand efforts to comply with new regulations. New government measures pertaining to increasing the security and ethical conduct of the supply chain are likely to require supply chain professionals to adapt further this year.

The following report details how the above risks are likely to test organizational resilience in 2021. While concerning, these challenges are not unmanageable. Organizations, armed with this knowledge can begin to plan mitigation actions and adaptive measures to ensure a secure and sustainable supply chain.

Jim Yarbrough
Director, Global Intelligence Programme, BSI

Introduction

2020 proved to be the most challenging year for organizations and the resilience of their supply chains in decades. Many of the obstacles that businesses faced last year clearly stemmed from the spread and aftermath of COVID-19, forcing organizations to adjust in novel ways to maintain their supply chain continuity, integrity, and overall resilience. Yet, at the same time, the spread of the virus seemed merely to exacerbate known threats and historical trends organizations have grappled with for years.

COVID-19 will certainly have latent effects on organizational resilience throughout 2021, directly and indirectly shifting the way organizations do business. However, several other issues, including increased regulation of supply chains and continued multifaceted impacts from business continuity events are poised to challenge businesses in parallel with the lingering impacts of the virus. This report explores those risks and projects the threats that companies are likely to encounter this year.

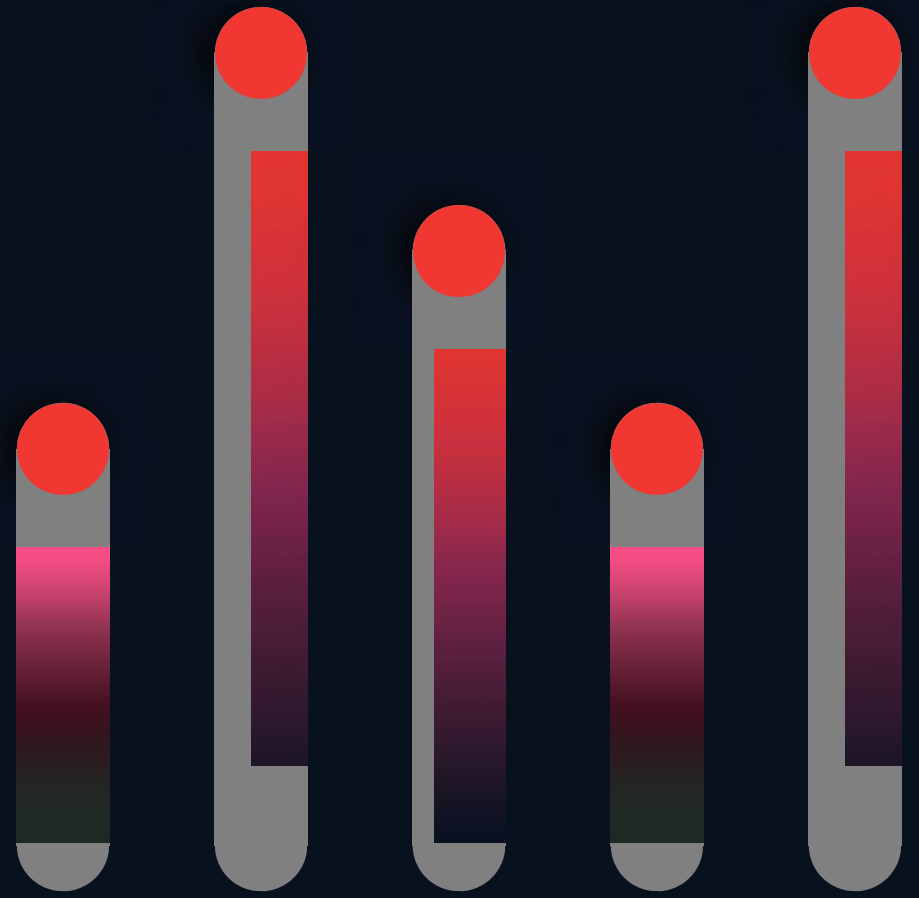
Organizational Resilience is defined by BSI standard BS 65000:

"the ability of an organization to anticipate, prepare for, respond and adapt to incremental change and sudden disruptions in order to survive and prosper".

Report highlights:

- COVID-19 continues to exacerbate existing threats and create new risks
- Cargo theft trends likely to return to pre-pandemic levels
- Economic hardships to propel risk of labour and migration issues
- Drug smuggling trends to remain consistent
- Labour strikes tied to economic downturn continue globally
- Food fraud and safety will continue to challenge supply chain resilience
- Increased regulations are likely to challenge organizational resilience

Chapter 1
Summary of forecast global risks



COVID-19: Exacerbating existing threats and creating new risks

Throughout 2020, COVID-19 posed one of the largest threats to the security, continuity, and resiliency of global supply chains, and it continues to cause disruptions, threaten supply systems, and have residual impacts. Many of the other concerns BSI monitored in 2020, including cargo crime, labour exploitation, human rights violations, drug smuggling, food insecurity, and man-made disruptions, remain risks to supply chain resilience in 2021.

The Americas

In the Americas, organizations, particularly those operating in North America, will likely encounter increased regulation in 2021. This trend is already in evidence with the escalation of US government withhold release orders (WROs) toward the end of 2020. These orders, 15 of which were issued by US Customs and Border Protection (CBP) in the second half of 2020 alone – a 150 per cent increase over WROs issued during the entirety of 2019 – culminated in an order in early 2021 that targeted an entire region and class of products, rather than specific organizations, as being produced by forced labour. Also notable was the issuance of new measures by the Canadian government that similarly require companies to take steps to ensure that forced labour doesn't exist in their supply chains. Other regulations, including the Securing America's Ports Act and the required implementation of the International Civil Aviation Organization's (ICAO) cargo screening standards, may also test business continuity and the general resilience of supply chains in North America.

The spread of COVID-19 had major detrimental effects on the economies of Latin America that are seen continuing to drive ongoing migration in the region, potentially exposing migrants to labour exploitation and leading to a rise in crime and social unrest as inequality grows. These issues are likely to come to a head in Peru, Haiti, Nicaragua, Chile, and Honduras, all of which have presidential elections in 2021 and may see shifts in political ideologies that could affect business operations.

Throughout 2020, COVID-19 posed one of the largest threats to security, continuity, and resiliency of global supply chains, and it continues to cause disruptions, threaten supply systems, and have residual impact globally.

Supply chain risk forecast
Americas

- Improving Trend
- Continued Trend
- Worsening Trend

Regulatory
Scrutiny on company supply chains likely to continue through application of regulatory changes or mechanisms, such as withhold release orders

Environmental concerns to likely play a greater role in trade negotiations with countries in the region

COVID-19 Impacts
Ineffective delivery, application of vaccine, and spread of new strains to likely lead to further lockdowns affecting supply chains in the region

Region to likely struggle in recovering economically, leading to potentially more security and labour rights concerns

Physical Security
Economic strife to likely perpetuate regional migration, with concerns for potential stowaway risks

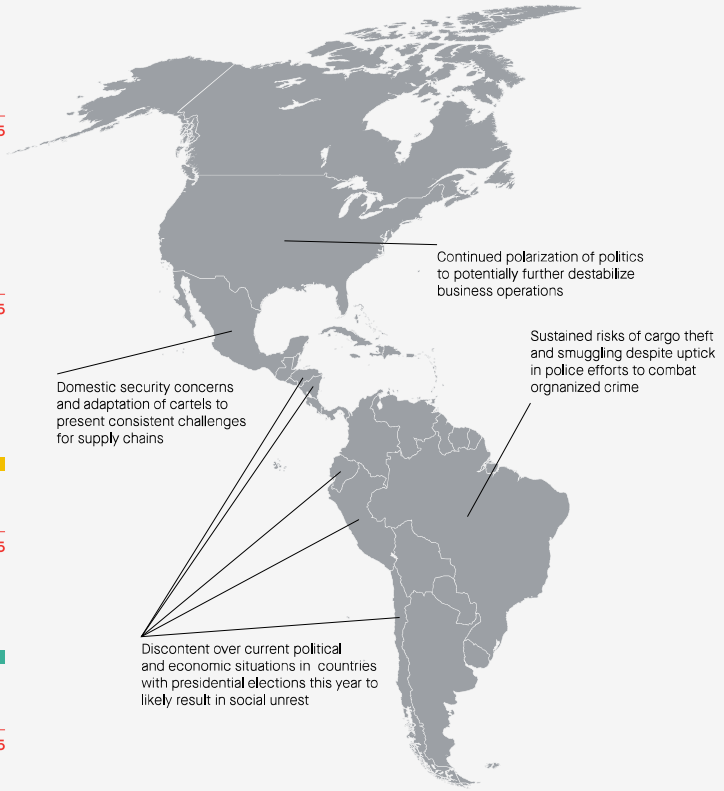
Inequality and poverty to likely drive more crime, creating new and exacerbating existing trends impacting supply chains

Entrenched criminal organizations to continue to drive region to the top as the world's primary producer of illegal drugs

Geopolitics
String of presidential elections in next two to three years to potentially result in swings in ruling parties as discontent grows over economic and government performance

Global importance of Latin America to likely continue to stagnate, leaving countries to focus on solving internal issues

Business Continuity
Inequality and economic disparity in Latin America likely to manifest itself in the form of more protests



Asia and the Middle East

In Asia and the Middle East, the spread of COVID-19 had similar negative effects on the regions' economies, forcing many countries, such as India, Indonesia, and Saudi Arabia, to adjust labour laws to remain competitive on the global stage. This move simultaneously weakened worker protections against exploitation. The impacts of these labour law adjustments are expected to manifest in 2021 and could be modified further, depending on the status of the virus in the region, potentially exposing a larger percentage of the working population to diminished labour protections. Other business continuity tests, including natural disasters resulting from climate change and the ongoing global imbalance of shipping containers, may carry into 2021 and threaten supply chain resilience.

Supply chain risk forecast
Asia Pacific

- Improving Trend
- Continued Trend
- Worsening Trend

Regulatory
Application of regulatory changes or mechanisms, such as withhold release orders, to pressure countries to improve human and labour rights issues

Signing of the Regional Comprehensive Economic Partnership may help to offset regional tensions while spurring economic growth

COVID-19 Impacts
More stringent safety controls for imported goods from known COVID hotspots to potential delay shipments, as lockdowns are implemented for resurgent hotspots

Region to likely initially struggle in recovering economically, driving more security and labour rights concerns as young population contends with unemployment

Physical Security
Physical security risks to remain comprehensive, with countries vulnerable to smuggling and possibly increased sea piracy for ships transiting the Strait of Malacca

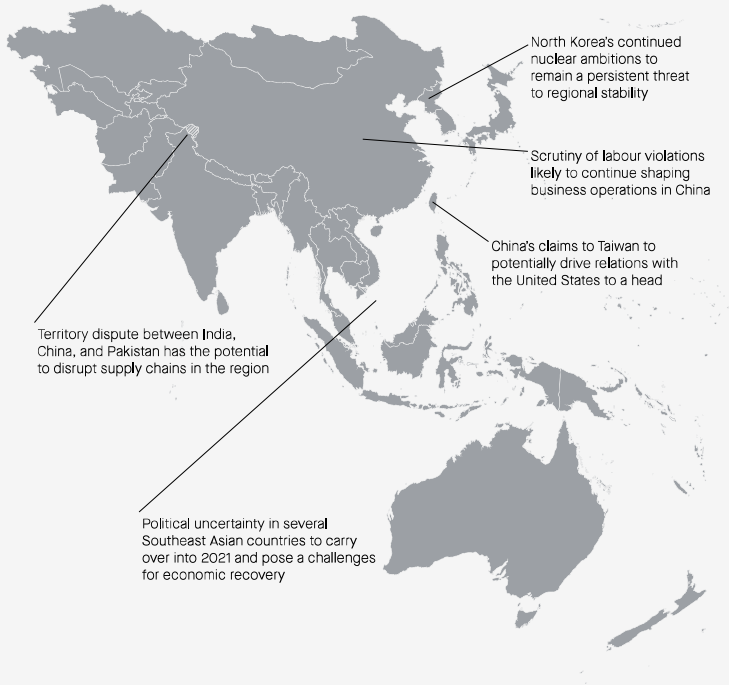
Potential for terrorism to make a resurgence in the region, with the disputed region of Kashmir a likely flashpoint

Geopolitics
Territorial disputes between China, India, and Pakistan to continue to threaten stability

US - China relationship to continue to be strained and could possibly come to a head over China's claims to Taiwan

Business Continuity
Capacity issues, stemming in part from container shortages, to hinder ability to move goods to destination markets

Climate change to impact transportation in Asia, especially in flood prone countries



Europe

In 2021, European supply chains will need to navigate the effects of Brexit, while increased regulatory compliance, like that seen in North America by the US government's increased issuance of WROs or the Canadian government's regulations restricting organizations from contributing to forced labour, will require a wider range of organizations to adjust their business practices. A growing focus on environmental sustainability should move to the forefront of regulatory developments in Europe, with the ongoing issue of deforestation in the Amazon blocking a conclusion to a trade agreement between the European Union (EU) and Brazil.

Africa

Terrorism could return to dominate supply chain risk in Africa in 2021, with rogue groups throughout the region certain to remain active this year. Also compounding supply chain resilience on that continent is the potential for more social unrest amid multiple countries' presidential elections this year. Furthermore, shifting regional alliances, economic downturn, persistent migration and ongoing conflict may add to the difficulties of operating in Africa.

Supply chain risk forecast
Europe, Middle East, Africa

- Improving Trend
- Continued Trend
- Worsening Trend

Regulatory — Yr 1 / Yr 3 / Yr 5

- Regional governments likely to continue to pass regulatory changes or mechanisms aimed at solving human rights issues
- Environmental concerns to likely play a greater role in trade negotiations with countries in the region
- Weakening economies and shifting migration routes, as seen in Gulf countries, to result in detrimental labour law changes

COVID-19 Impacts — Yr 1 / Yr 3 / Yr 5

- Continued localized lockdowns as outbreaks occur, contingent on countries' ability to effectively and efficiently vaccinate citizens
- Gulf countries to continue nationalizing economies due to worsening economies from the pandemic and drop in oil prices

Physical Security — Yr 1 / Yr 3 / Yr 5

- Piracy along the Gulf of Guinea will likely shift back to focusing on oil-based targets as oil prices recover to pre-COVID levels
- Terrorism will continue to disrupt the supply chains in the Horn of Africa, West-Central Africa, and the Sahel region

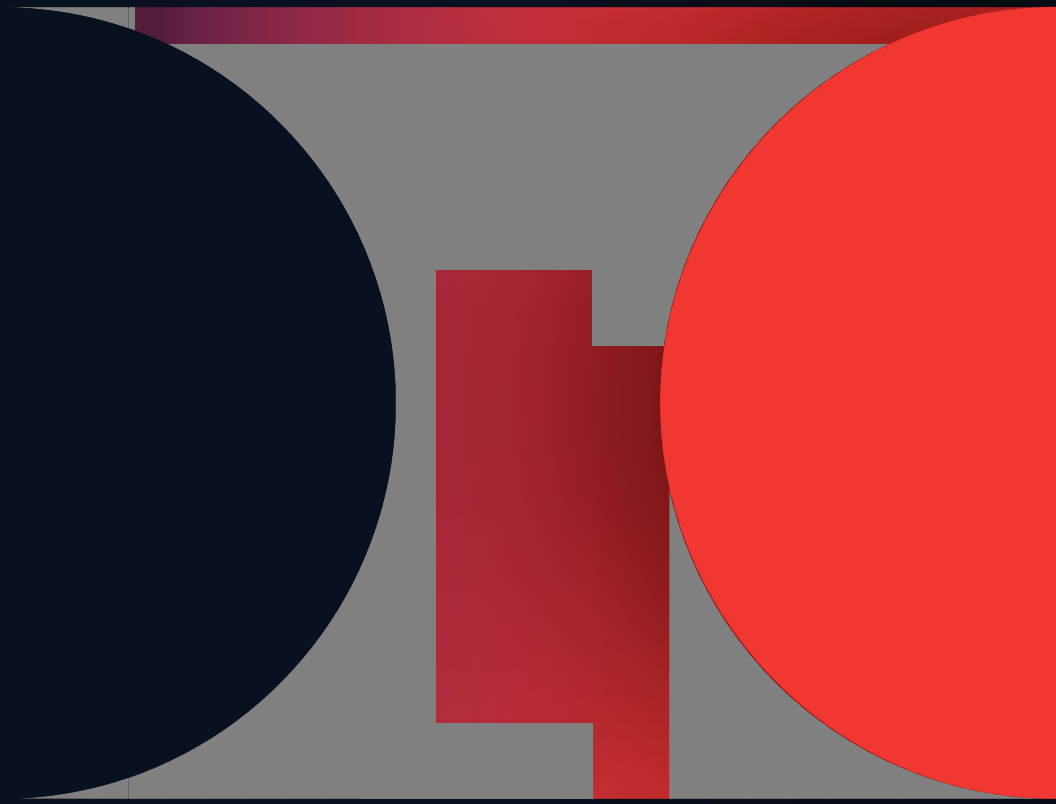
Geopolitics — Yr 1 / Yr 3 / Yr 5

- Increased potential for political shifts in the Middle East and North Africa resulting in changes to regional alliances
- Decreasing barriers for business opportunities between Arab nations and Israel, as diplomatic ties are formalized
- United Kingdom and European Union relationship to likely continue to face tests relating to Brexit

Business Continuity — Yr 1 / Yr 3 / Yr 5

- Increased potential for social unrest in Africa, as ten countries prepare for elections in 2021, including Ethiopia, Somalia, and South Sudan
- Potential for increased investment in Africa as the region possibly becomes a cheaper alternative for manufacturing

Chapter 2
Cargo theft trends



Cargo theft trends likely to return to normal following pandemic shifts

- The spread of COVID-19 forced criminals to adapt, causing a shift in regional trends, such as greater targeting of certain products and modalities. BSI Connect SCREEN intelligence noted an increase in thefts from facilities in Africa and Europe, and an increase in stolen medical supplies
- Despite these changes noted in BSI incident data, some trends stayed the same, such as Latin America continuing to suffer a high number of hijackings and the US and Canada seeing consistent trends in the targeting of trucks parked in vulnerable locations
- As the spread and impact of COVID-19 lessens, cargo theft trends are expected to return to pre-pandemic levels, with certain types of goods losing value again, such as Personal Protective Equipment (PPE), and the resumption in trade leading to more movement of vehicles, restoring thieves' opportunities to again strike this transportation mode

BSI-recorded cargo thefts of medical devices and supplies, which includes PPE, jumped by over 5,000 per cent in 2020 compared with 2019.

The spread of COVID-19 in 2020 not only affected legitimate supply chains and business operations, it also forced criminals to adapt. This led to shifts in regional cargo theft trends, including more targeting of goods not commonly seen as attractive to thieves and an added vulnerability for shipments stalled in facilities. This, in turn, led to more thefts involving warehouses and distribution centres in Europe and Africa. Although the spread of COVID-19 continues to influence cargo theft around the world, it's expected that the altered patterns of 2020 will revert to historic norms as the pandemic fades.

In many ways, cargo theft trends in 2020 stayed similar to activity seen in previous years; Latin America continued to suffer an extreme rate of cargo truck hijackings, for example, accounting for 60 per cent of cargo theft incidents recorded in South America and 78 per cent of thefts occurring in Mexico last year. In the US and Canada, thieves continued to steal trucks parked in vulnerable locations, accounting for 66 per cent of theft.

The spread of COVID-19 in 2020 brought about increased targeting and theft of products unusual for cargo theft incidents — arguably the most pronounced shift in this area last year. Early on, during the initial spread of the virus, thieves began to target essential goods, or products associated with preventing the spread of COVID-19, at a much higher rate as the limited supply and spike in demand drastically increased the black-market value of such items. Thefts of products such as PPE and chemicals, including hand sanitizer, and food and beverages, jumped in frequency worldwide, replacing the theft of goods more historically targeted, such as electronics. BSI-recorded cargo thefts of medical devices and supplies, which includes PPE, jumped by over 5,000 per cent in 2020 compared with 2019. Overall, the highest number of PPE thefts occurred in Europe, where a much larger portion occurred at warehouses: 70 per cent took place at warehouses and storage facilities, while only 30 per cent of thefts involved cargo trucks. Alcohol and tobacco products similarly saw a jump in thefts around the world as consumption rose while people were under lockdown.

Latin America continued to suffer an extreme rate of cargo truck hijackings, accounting for 60 per cent of cargo theft incidents recorded in South America and 78 per cent of thefts occurring in Mexico last year. In the US and Canada, thieves continued to steal trucks parked in vulnerable locations, accounting for 66 per cent of theft.

While COVID-19 drove this trend in targeting commodities, other factors also led to a spike in theft of such products. In general, the volume of such shipments increased to meet the surge in demand, giving thieves ample opportunity. In addition, and in BSI's experience, the typical security applied to such shipments is generally much lighter than that applied to high-value loads of electronics or pharmaceuticals, which contributed to the elevated rate of some types of theft.

Although global cargo theft trends are likely to reset to the norm once the spread and impact of COVID-19 lessens, the pandemic will continue to influence these trends around the world during 2021, with a spike in incidents involving medical-grade oxygen being the latest development. Many regions, including Latin America, the Middle East, and Africa, are facing extreme shortages of medical-grade oxygen as demand, pushed up by rising cases of COVID-19, has depleted normal global supplies. This shortage has sent the black-market price for medical-grade oxygen soaring, leading to a dramatic rise in the appeal of the product for cargo thieves in affected regions. As a result of this spike in price and demand, BSI recorded multiple cargo thefts involving medical-grade oxygen in the later months of 2020 before picking up dramatically in early 2021. Incidents so far this year represent a 200 per cent increase over total 2019 theft.

Looking forward to the rest of 2021, none of the COVID-19 impacts on cargo thefts are expected to remain permanent. Once the virus declines, it seems as if certain types of goods that spiked in terms of theft will lose value and therefore account for less crime moving forward, as illustrated by BSI Connect SCREEN intelligence noting a decrease in the frequency that PPE had been stolen in the second half of 2020. Additionally, cargo thefts of medical devices and supplies, while still seeing some targeting by thieves, dropped by 25 per cent in the second half of 2020 versus the year's first two quarters. However, the economic impact of COVID-19 has been detrimental for economies around the world, so it is possible that crime, including cargo theft, may rise in the early part of this year as individuals continue to try to compensate for lost income.

Looking forward to the rest of 2021, none of the COVID impacts on cargo thefts are expected to remain permanent. Once the virus declines, it seems as if certain types of goods that spiked in terms of theft will lose value and therefore account for less crime moving forward.

Advisor Insight

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Organizations looking to mitigate cargo crime in their supply chain need to stay ahead of risk. By proactively understanding the risk profile of a region, implementing relevant procedures to secure the supply chain, and consistently re-evaluating crime vulnerabilities, organizations will build a supply chain that is ahead of the criminal tactics and trends detailed in this report. To better prepare for and respond to emerging risks, organizations should consider the following recommendations to protect cargo, both in-transit and when at rest:

- Review security risk assessments regularly to identify and capture emerging theft risks and apply loss prevention measures
- Review operational security measures for facilities that are closed or where there are reduced operations to ensure appropriate protection is in place
- Review facility security systems and physical maintenance programs to ensure security equipment is operational during closed or reduced-activity periods
- Review service-level agreements with security service providers; where an increased risk of theft is identified, consider increasing the number of personnel patrolling the facility as a deterrence
- Liaise with local law enforcement to understand crime activity and risks, and where appropriate, consider requesting regular police visits to the facility
- Transportation organizations should regularly review their route risk management planning and anti-hijacking protocols to ensure effective alarm response and escalation communications, particularly with law enforcement.

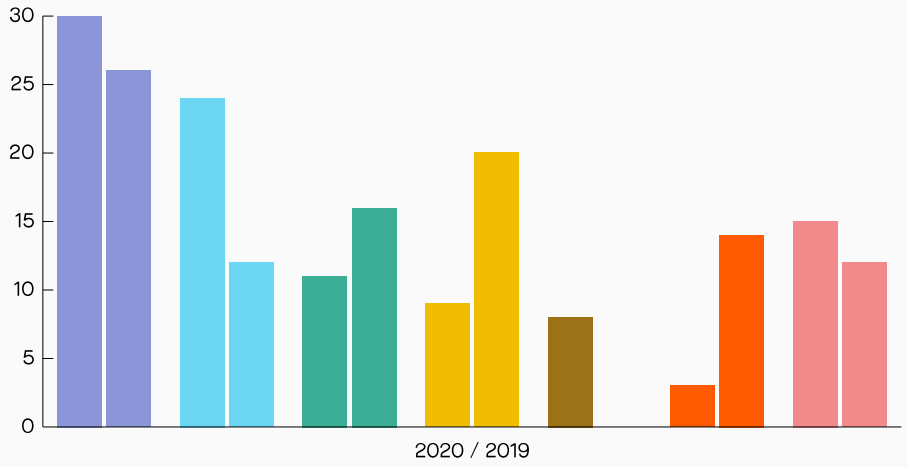
Warehouses and facilities storing and distributing products attractive to thieves should be more vigilant than ever with their security protocols. Specifically focus on managing and controlling access to products and logistics information, including:

- Locking storage areas when not in use, and strictly controlling the number of personnel given access to these areas
- Meticulously control and record who is authorized to access product logistics information
- Manage access to restricted storage areas with physical keys or swipe-card protocols Record issuance and return of physical keys in a log; all keys should be secured when not in use
- Train staff to recognize and report suspicious activity or unauthorized persons seeking access to restricted areas or product logistics
- Ensure appropriate due diligence is conducted when hiring temporary staff, and strictly supervise their activities and access to restricted areas and logistics information.

Cargo theft trends
Global 2019 v. 2020

Cargo theft types

	2020	2019
Hijacking	30%	26%
Theft from facility	24%	12%
Theft of vehicle	11%	16%
Theft from vehicle	9%	20%
Theft from container/trailer	8%	0%
Slash and grab	3%	14%
Other	15%	12%



Modalities of theft
2019

87%
Truck

10%
Facility

1%
Sea

2%

2020

71%
Truck

25%
Facility

<1%
Sea

4%

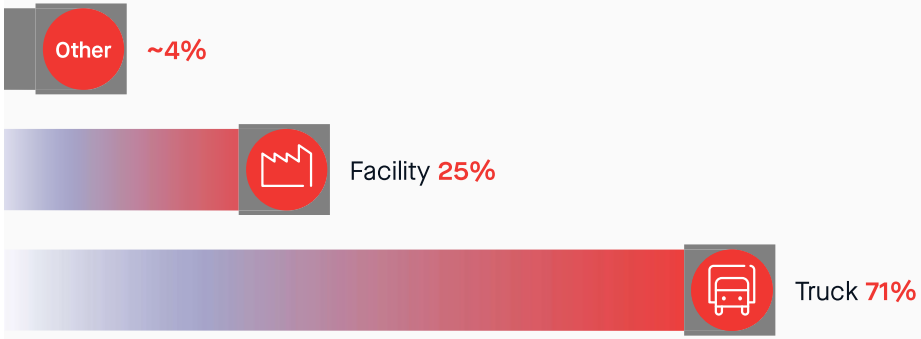
Cargo theft trends
Global 2020

Cargo theft types
2020

Hijacking	30%
Theft from facility	24%
Theft of vehicle	11%
Theft from vehicle	9%
Theft from container/trailer	8%
Other	18%

Top commodities stolen
2020

Modalities of theft
2020



Top countries for cargo theft
2020

- Brazil
- India
- Mexico
- Germany
- Russia
- United Kingdom

Chapter 3
Migration trends

Economic hardships to propel risk of labour, human rights violations, and stowaway smuggling

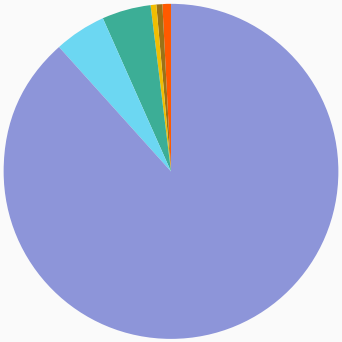
- COVID-19's pushing economies into lockdown put the world's most vulnerable communities at greater risk of labour exploitation and human rights violations, creating new migration trends as people attempt to avoid hardships and seek economic opportunities
- At the start of 2020, border closures and other pandemic impacts led to a decrease in migration, but new stowaway smuggling routes and labour risks developed later in the year as controls declined but economic opportunity continued to be sparse, leaving migrants outside their countries susceptible to labour exploitation

Shifting migration routes in Europe, Asia, Middle East and Africa

Mass migration on its own does not pose an overt threat to supply chains; instead, it is the tendency for some individuals, often facilitated by organized crime, to exploit gaps in security that are the real risk. Europe and the Americas are two regions where stowaways are consistently present in supply chains. This trend proved to be true throughout 2020 and will almost certainly carry over into 2021. As in previous years, an overwhelming majority of stowaway incidents involved the trucks, accounting for approximately 89 per cent of incidents recorded by BSI. Lockdowns and restrictions created queues and idle times for trucks, further aggravating this problem in 2020.

Top Modalities of stowaway incidents 2020

Truck	89.13%
Rail	4.98%
Sea	4.9%
Van	0.54%
Air	0.38%
Facility	0.08%



Despite the temporary downturn in migration early last year due to COVID-19 and related lockdowns, a significant increase and shift in migration occurred by summer[1]. Escalating political and economic issues led migrants increasingly to attempt to reach other regions of the world, notably migrants from North Africa and the Middle East traveling to Europe.

An uptick in migration from the Middle East and North Africa occurred along the Balkan and Central Mediterranean routes[2], with human traffickers often targeting trucks to move stowaways. Migrants in border EU countries, often facilitated by human traffickers, will attempt to stow away into parked and slow-moving trucks.

Although migration levels in Europe continue to remain well below peak levels, with the EU border agency, Frontex, indicating that irregular migration into the region last year was at its lowest point since 2013 due to the spread of COVID-19[3], the risk of stowaways remains for organizations operating in Europe.

Stowaway risks in Europe

- Migration route
- EU Schengen
- EU Non-Schengen
- Non-EU Schengen

Countries of detection in recorded stowaway incidents 2020

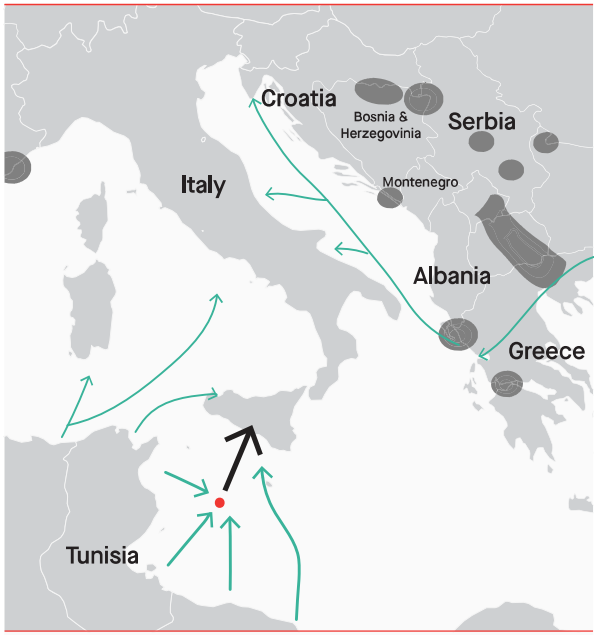
Romania 16%
Greece 7%
North Macedonia 7%
Germany 9%
France 7%
Other 55%

Modalities of recorded stowaway incidents 2020

93% Truck
3% Rail
2% Sea
2%

[1] https://frontex.europa.eu/media-centre/news/news-release/situation-at-eu-external-borders-arrivals-picking-up-still-down-for-the-year-nqkCT5
[2] https://frontex.europa.eu/media-centre/news/news-release/irregular-migration-into-eu-last-year-lowest-since-2013-due-to-covid-19-j34zp2
[3] https://frontex.europa.eu/media-centre/news/news-release/irregular-migration-into-eu-last-year-lowest-since-2013-due-to-covid-19-j34zp2

Besides migration from the Middle East and Africa towards Europe, the Americas also continued to experience a high number of stowaway incidents in 2020. Like Europe, authorities there initially recorded a slight dip in frequency at the beginning of the year, but movements eventually increased as controls to stop the spread of COVID-19 eased[4]. Throughout the year, the dominant trend in stowaway activity was through shipments originating in Mexico and destined for the US, primarily Texas. Some migrants from Central American countries, attempting to travel north to the US, tried to do so by stowing away in trucks or by forming large caravans passing through Mexico either on foot or on top of rail freight. The frequency of these events suggests that such a risk will continue into 2021.



Migration trends in the Mediterranean

Based on historical data and qualitative analysis

- Hospots for migrant discovery
- Migrant transit point in Lampedusa, Italy
- Illegal migration route
- Legal migration route

General path of rail freight routes in Mexico used by migrant stowaways

- El Diablo rail
- La Bestia rail freight route

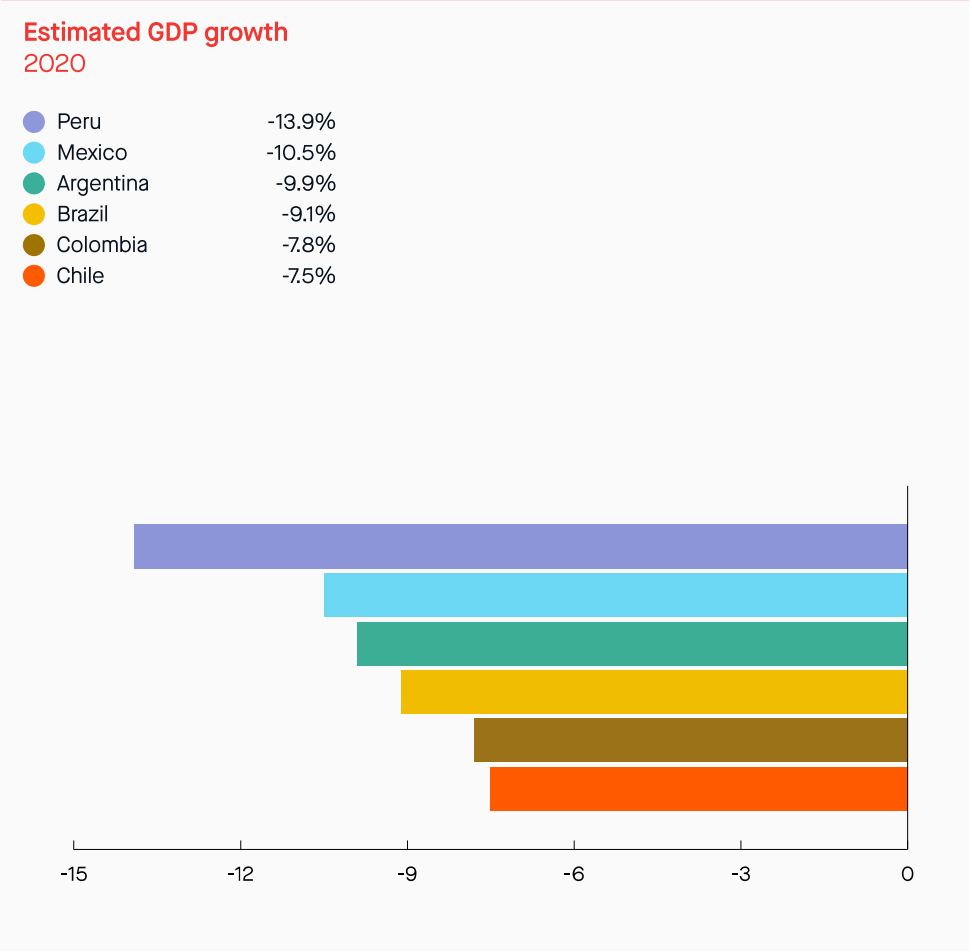
[4] https://www.cbp.gov/newsroom/national-media-release/cbp-announces-january-2021-operational-update

Further COVID-19 fallout: Child labour forecast to increase in Latin America

Along with the security risks to supply chains associated with mass migration, it also poses several key corporate social responsibility risks, most notably, the increased potential for labour rights violations. Various international organizations have voiced concern over the growth of child labour in countries across Latin America due to the economic and social impacts of the pandemic. At the start of the pandemic, the International Labour Organization (ILO) predicted that child and forced labour would increase due to the crisis[5] and some signs of that materializing have been seen both in 2020 and early 2021.

The multifaceted nature of child labour in developing countries has made tackling the issue difficult, especially as the economic situation has deteriorated in some countries. Further, as these hardships continue and schools remain closed, child and forced labour incidents are seen increasing in 2021, as the possibility grows of all family members being forced to work to make a living. Hence, focusing on mitigating these threats and enhancing the vetting of suppliers and workers throughout the supply chain is increasingly important in 2021.

Decreased economic output also has influenced government revenue and, in turn, the ability to enforce labour laws. According to the International Monetary Fund (IMF), major Latin American countries have significant projected decreases in gross domestic product (GDP), with Mexico, Ecuador, Peru and Argentina standouts for detrimental economic impact[6]. Many governments have sought to spur growth by scaling back labour regulations in reaction to the economic downturn. However, deregulation holds the inherent risks of increasing child and forced labour, as well as worsening general working conditions.



[5] https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_747583/lang--en/index.htm
[6] https://blogs.imf.org/2020/10/22/pandemic-persistence-clouds-latin-america-and-caribbean-recovery/

Chapter 4
Drug smuggling trends

Drug smuggling trends to remain consistent as details shift

- Gangs in the historical production centres for illegal drugs in Latin America and Asia continued to produce and attempt to transport to the same destinations, including North America and Europe
- However, smugglers employed novel methods of concealment or routes to move shipments of illegal drugs to destination markets in North America and Europe

As with cargo theft, the spread of COVID-19 had a major impact on drug smuggling in 2020, leading groups to adapt in tactical ways that led to altered risks to supply chains. The spread and response to COVID-19 had cut off traditional supply chains through lockdowns and mobility bans, challenging operators, port security, and other introduction points. Despite these changes, smugglers adapted to the COVID-19 world by changing means and methods, while largely following historic patterns. This ingenuity could continue to confront organizations throughout this year, with smugglers using novel methods of concealment or routes to move shipments of illegal drugs to destination markets in North America and Europe.

While not all dockworkers are corrupt of course, there are some workers who will coordinate with gangs at ports in South America to remove the drugs from ships and put them on cargo trucks transiting Europe. Shipments of illegal drugs found in cargo in Europe were embedded in food and beverage products on a large scale in 2020.

The closure of the US-Mexico border to all but essential traffic, namely freight, removed a key avenue for cartels to traffic illegal drugs into the US.

COVID-19 affects criminal supply chains in Asia and the Americas

Just as with many organizations, Mexican drug cartels felt the impact of the initial outbreak and spread of COVID-19 on their criminal supply chain in 2020. The measures implemented to halt the initial spread of COVID-19 disrupted the ability of cartels to secure the chemicals needed to produce illegal drugs, along with the cocaine from South America that cartels sell both domestically and internationally.

Beyond the supply disruption, the US government's announcement of enhanced illegal drug interdiction efforts in the Caribbean Sea converged with ingredient supply constraints to have an impact on Mexican cartel supplies. As a result, cartels were forced to develop alternative sources. Perhaps most notably, the closure of the US-Mexico border to all but essential traffic, namely freight, removed a key avenue for cartels to traffic illegal drugs into the US. That, combined with supply constraints, had significant ramifications for supply chains in the short to medium term. Cartels increasingly looked to exploit corrupt individuals or to infiltrate supply chains deemed essential to replace this restricted transportation route.

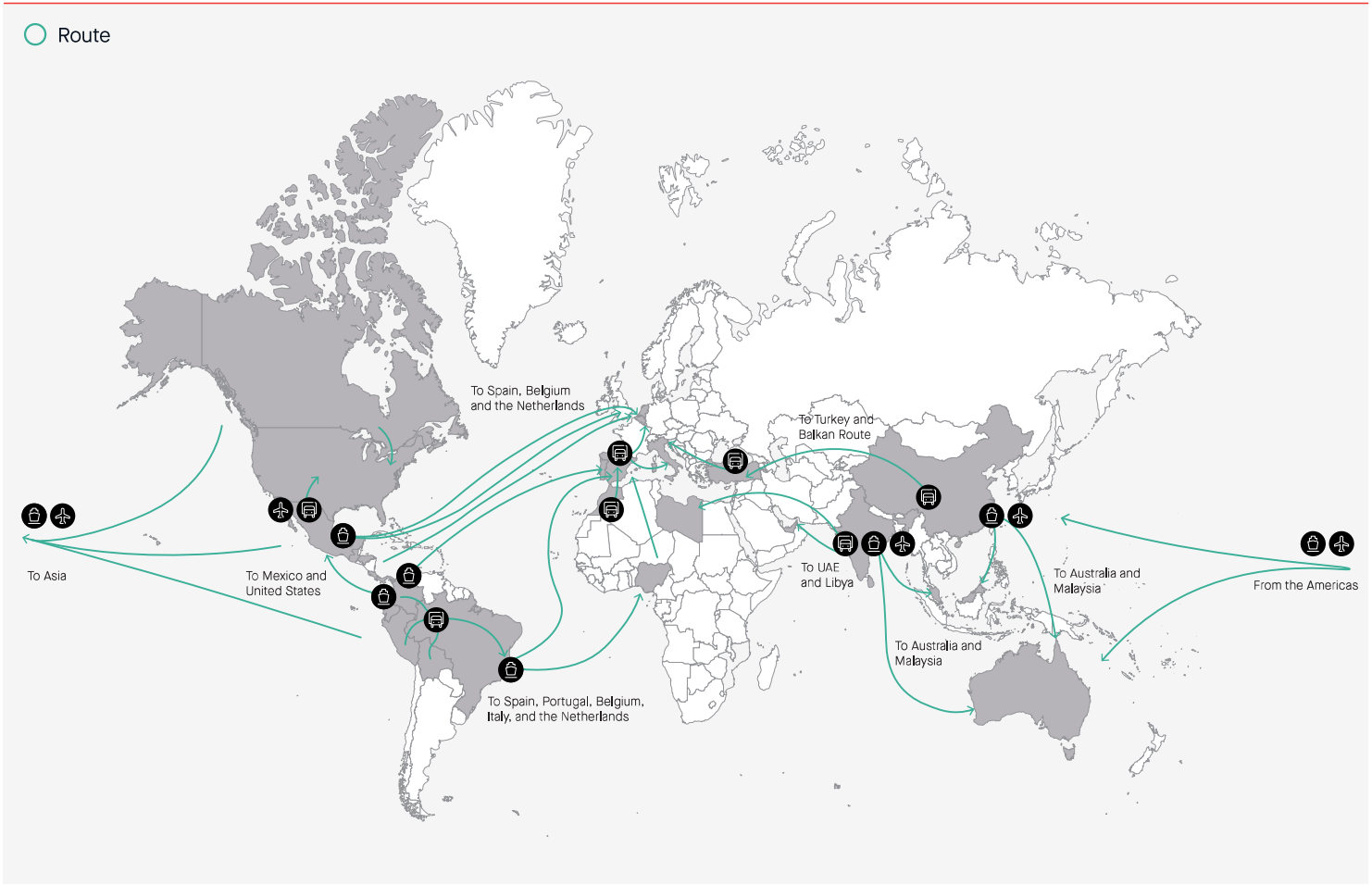
The impact of COVID-19 was measurable in seizure totals by month, which fell last year from March to the lowest level in May before picking up significantly through August. One possible adaptation that can help to explain the uninterrupted trafficking of substances, including methamphetamine and fentanyl, could be a pivot to air cargo as a means of acquiring the chemicals to produce illegal drugs. BSI Connect SCREEN intelligence noted this by recording two seizures of fentanyl from air cargo shipments.

Another possible factor to explain the continued ability of cartels in Mexico to traffic illegal drugs is the development of alternative chemicals, beyond diversifying their sources of chemicals.

Lastly, thefts of legal pharmaceuticals have occurred on a massive scale in Mexico since the outbreak of COVID-19, with incidents often occurring at hospitals, pharmacies, and even from freight.

Major global illegal drug smuggling flows 2020

Truck Sea Air



Advisor Insight

Tony Pelli
Practice Director, Security and Resilience, BSI

Tips for leveraging technology to audit business partners in the post-COVID-19 world

Organizations are increasingly using technology to carry out remote audits of business partners around the world. However, there are several considerations and tips that organizations should follow to ensure effective implementation of such audits.

- Immersive technologies have allowed organizations to reach their suppliers more easily through virtual means
- Even post-pandemic, it is likely that remote assessments that include in-depth document review paired with immersive technology giving a live view of the site will continue to be used to connect in-demand specialists and allow for the ability to see hard-to-reach areas and real-time assessment
- Moving forward, these types of technologies will allow organizations to troubleshoot supply chain issues in real time
- Organizations will be able to give their suppliers training, assistance with investigations, and on-demand review of standard operating procedures whenever needed without traveling to a site
- We suggest reaching out to suppliers to understand their willingness and ability to participate in virtual assessments, auditing, and coaching.

Questions and considerations should include:

- How good is the internet, Wi-Fi, and cell signal at the site to allow for sharing of video? Recording of videos can work, but live video is preferred
- What is the best way to share documents securely and confidentially?
- What are the key portions of the facility that the company wants to see and assess, either in pictures or live video? For security assessments, we suggest both interior and exterior loading docks, facility perimeter, all visitor and employee entrances, any key production areas, IT control rooms, video and alarm control rooms, and a walk around the exterior of the facility. A floor plan of the site can be helpful for planning
- Who will participate in the audit? Prepare an agenda to better plan when speaking with key personnel on-site

Emerging drug-smuggling trends

The increase in trafficking of methamphetamine and fentanyl from Mexico to the US is expected by BSI to continue in 2021. This, in turn, could affect measures that organizations take to mitigate the risk of illegal drug smuggling in their cargo. In line with BSI-recorded incidents involving cargo, data from CBP shows an increase in seizures of methamphetamine and a decrease in cocaine seizures for 2020[7].

BSI intelligence-recorded seizures of illegal drugs from cargo entering the US

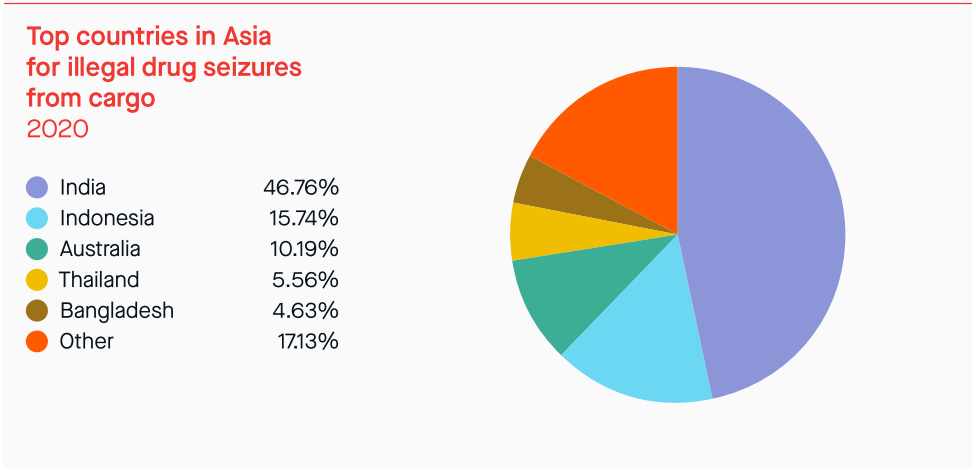
	2019	2020
Amphetamine-type stimulants	22.4%	40.6%
Cannabis	27.5%	27.2%
Coca and Cocaine	38.7%	24.28%
Other	11.2%	7.8%

Disruptions in cargo flows between cocaine-producing countries and cocaine-importing countries during the spread of COVID-19 probably forced organized criminal groups to find different smuggling routes and to seek new modalities for transporting drugs. In addition, markets for cocaine have shifted, with Europe taking over as the top destination for the illegal substance, while the US market became dominated by amphetamine-type substances. The increased smuggling of methamphetamine tracks with trends outlined by the United Nations Office on Drugs and Crime (UNODC) and US Drug Enforcement Administration (DEA).

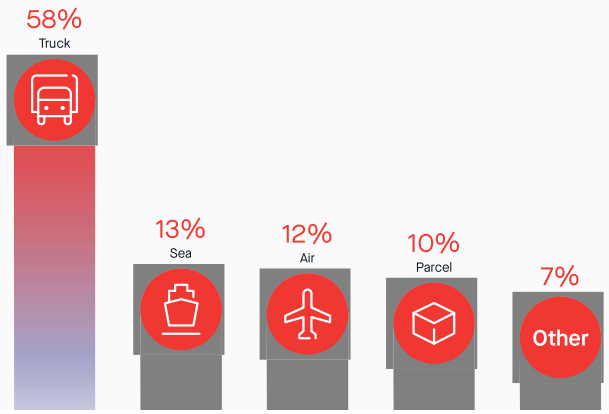
This trend in illegal drug seizures in the US is expected to continue in 2021 and require organizations to shift strategies to combat the risk in several slightly different ways. Unlike marijuana and even cocaine, seizures of methamphetamine largely have been less-than-truckload quantities. This suggests that organizations may be more likely to encounter the introduction of illegal drugs in otherwise-legitimate shipments of goods, rather than by dedicated truckloads facilitated by corrupt supply chain employees. A shift to greater emphasis on employee vetting may help mitigate this risk, rather than concentrating on vetting the contracting company to determine legitimacy.

Another trend that BSI expects to continue in 2021 is the growing trade of illegal drugs in Asia. Last year, the proportion of incidents of illegal drugs seized from cargo in Asia increased by 77 per cent over 2019 in BSI Connect SCREEN intelligence-recorded incidents. Although in terms of raw numbers, more seizures of illegal drugs from cargo still occur in the Americas and Europe, the increased proportion of incidents occurring in Asia is indicative of the growing smuggling trend in the region.

Top countries in Asia for illegal drug seizures from cargo
2020



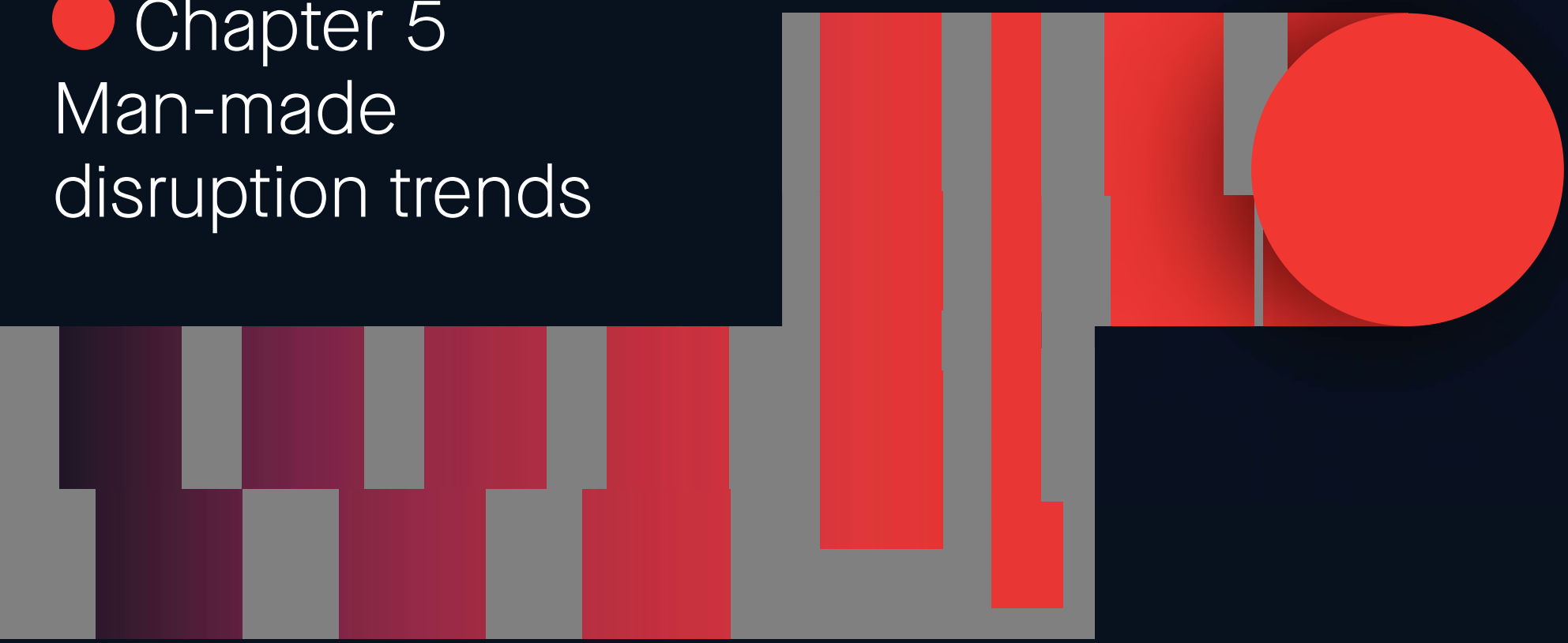
Modality of seizures of illegal drugs from cargo in Asia
2020



[7] https://www.cbp.gov/newsroom/stats/cbp-enforcement-statistics-fy2020

The growing trade of illegal drugs in Asia is expected to continue in 2021. Last year, the proportion of incidents of illegal drugs seized from cargo in Asia increased by 77 per cent over 2019 BSI-recorded incidents.

Chapter 5 Man-made disruption trends



Political protests and labour strikes to carry into 2021

- The risk of man-made disruption to supply chains grows as the consequences of the pandemic amplify socio-economic inequalities
- Widespread human-led disruption initially decreased in the first half of 2020 due to lockdown measures
- Governments and supply chains may face new challenges in 2021 as single-issue anti-lockdown protests or industry-specific labour strikes evolve into complex anti-government protests that challenge the resilience of business operations

Political protests not stopped by COVID-19 lockdowns

Political protests and labour strikes will remain prevalent in 2021 as countries continue to grapple with the uncertainties of a pandemic, high rates of unemployment, and continued social unrest. In 2020, protests occurred in each region of the world, with some of the most impactful ones reported in Belarus, Russia, the Netherlands, and Germany in Europe; Hong Kong, India, and Myanmar in Asia; Chile and Brazil in South America; Mexico and the US in North America; Iran, Lebanon, and Israel in the Middle East; and South Africa, Nigeria, and Tunisia in Africa. While varied events initially triggered these protests, in most cases the unifying trends underlying them are stagnating inequality and poor living standards.

As political protests emerged, some remained concentrated, resulting in generally peaceful demonstrations with limited impact to business operations, as seen in parts of the US and Europe. In other instances, social unrest quickly evolved into nationwide demonstrations, sometimes becoming violent and highly disruptive as protestors demanded political changes through strikes, road blockages, and looting, as was seen in Belarus, Nigeria, and India.

Labour strikes tied to economic downturn continue globally

As the pandemic takes its toll on economies, workforces across various industries have been hit by unanticipated business closures and subsequent unemployment. As a result, some countries initiated changes in labour laws, disallowing or making collective bargaining more difficult and other movements, as seen as a part of Indian labour law reforms in Q3 2020, for example[8]. These moves led to a significant increase in labour strikes in the second half of 2020, following facility closures and restrictions on gatherings.

Globally, BSI Connect SCREEN intelligence recorded 27 per cent of labour strikes taking place in the food and beverage industries, followed by 13 per cent in the metals industry and 12 per cent in the apparel and footwear sector.

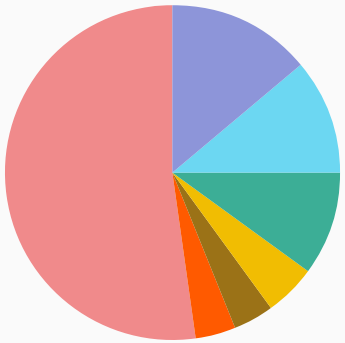
However, as the economy opens back up around the world following the pandemic, labour strikes could ensue with demands related to compensation, wage withholdings, and benefits, as well as payment for added complexities resulting from working through the pandemic.

[8] India Ministry or Labour and Employment, 2020: http://egazette.nic.in/WriteReadData/2019/210356.pdf

Top industries experiencing labour strikes 2020

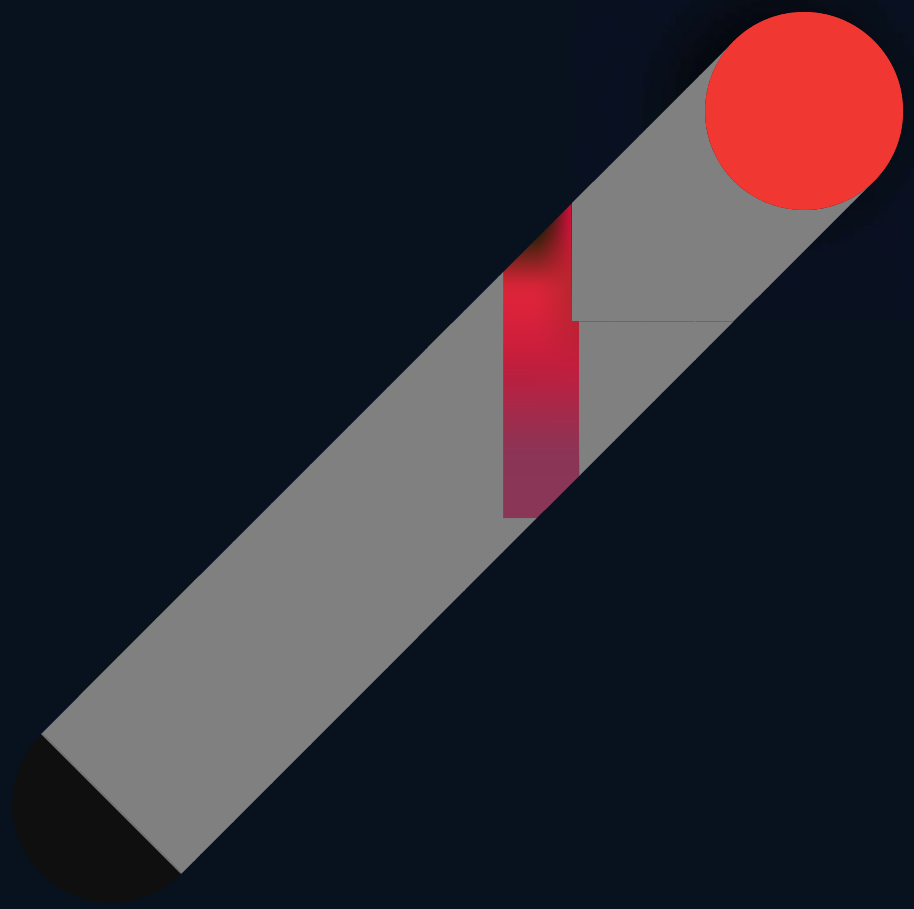
Food and Beverage	27%
Metal	13%
Apparel and Footwear	12%
Fuel	10%
Manufacturing materials	6%
Construction materials	5%
Other	27%

Top countries experiencing labour strikes 2020



Italy	14%
India	11%
France	10%
Argentina	5%
Greece	5%
Bangladesh	4%
Other	52%

Chapter 6
Business continuity planning



Disruptive events highlighting importance of business continuity planning

- Increasingly, natural disasters and man-made disruption are having multiple impacts on business operations, either through secondary or tertiary continuity challenges or exposure to security threats such as cargo theft

- These incidents must be analyzed from multiple angles to determine the true impact to businesses, so comprehensive planning is important

Like man-made disruption and the effects of COVID-19, shifting business continuity challenges for supply chains remain widespread. In 2020, incidents ranging from rising container shortages to transporting constraints in the United Kingdom (UK) highlighted the need for business continuity planning. Another ongoing concern is the growing risk that natural disasters pose for supply chain resilience, as demonstrated, for example, by the impact of major storms in Vietnam on transportation through port and road closures last year.

As we begin 2021, we notice that these disruptive events continue to have significant impact on business operations, worker safety, and transportation continuity. This trend should intensify as the pandemic continues to reveal and, in some cases worsen, existing supply chain issues. In a survey conducted by BSI last year, 62 per cent of organizations reported having a business continuity plan in place.[9] Even for those with continuity plans, supply chain disruption remains a top three concern throughout 2020.

Simultaneously, climate change presents an increasing threat to supply chains around the world. There are also concerns that the economic, as well as physical, effects of the pandemic will hinder disaster recovery efforts as countries re-allocate funds or slow recovery efforts with more lockdown measures. In the same vein, organizations should ensure their internal relief funds aren't re-allocated to counter the negative economic effects of the pandemic.

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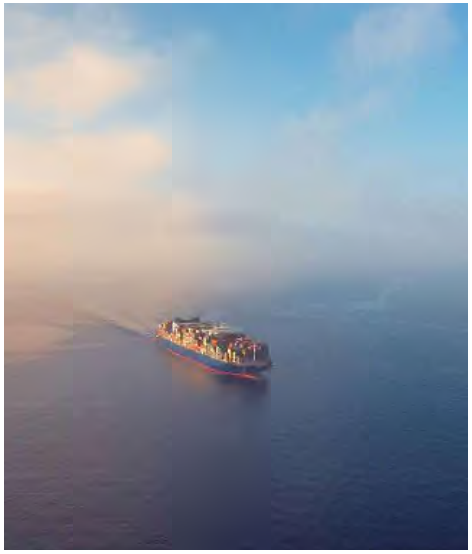
[9] https://www.bsigroup.com/topics/novel-coronavirus-covid-19

Multifaceted impact of natural disasters and man-made disruption

Throughout last year, natural disasters and man-made disruption not only had business continuity impact on organizations but also often led to new security and other types of concerns.

Natural disasters are increasingly creating both business continuity and security concerns around the world. This trend is seen intensifying in 2021, given the ongoing disruption from COVID-19 combined with repeated storms, earthquakes, and other types of natural disasters. In addition to the more obvious impacts of natural disaster events, such as facility and infrastructure disruption, BSI recorded other impacts as well, such as protests involving rail blockades and disrupting international supply chains in Mexico. Protests and labour strikes may not seem to have direct impact on the security of supply chains but they often indirectly make freight vulnerable. Besides adding security concerns, these types of incidents can hinder other operations, such as the ability to obtain insurance.

There are several countries that can be highlighted as examples. In Mexico, BSI Connect SCREEN intelligence recorded lengthy protests that involved railway blockades that stalled cargo via that modality, creating a backup of goods at ports, storage facilities, and even on railways themselves when freight trains were unable to travel. This backup of goods created an added exposure to cargo theft, especially if organizations did not anticipate situations in which shipments would be required to remain in storage facilities. BSI Connect SCREEN intelligence recorded



another example in Vietnam, where the country experienced repeated, major storms last year. Authorities said the typhoons, which they referred to as “abnormal,” resulted in a total of $1.3 billion in damage. While storms are a major concern for the continuity of supply chains because they cause forced closure of ports and roads, such incidents can also affect the security of shipments because evacuations can leave facilities vulnerable to theft.

Another example can be seen in the spread of wildfires in California last year, which highlights the myriad challenges that natural disasters can pose to supply chains. Wildfires can disrupt supply chains, including delaying transportation. Interruptions to utilities can also occur, including preventing manufacturing or other operations, as was the case for organizations in California. During last year’s wildfire season, many had to contend with blackouts instituted by the state power operator that left residents and businesses without electricity to prevent further fires. Other wildfire issues are also highly relevant for employee safety: In California, smoke conditions also posed a risk to those working in affected areas, which forced some organizations to halt operations.

The threat that these incidents posed to supply chains highlights the need for establishing and updating comprehensive risk assessments based on current geographical risk of all types of natural disasters and man-made disruption. Whether natural or man-made, the assessment should also integrate parts of the organization that are perhaps more focused on security.

Second, current and flexible contingency plans should be in place and provided in employee training so that the proper actions can be taken in the event of an incident impacting business continuity. One effective way to ensure that response plans are flexible is to develop broad, enterprise-level policies that are then altered slightly for regional risk differences.

Organizations should implement a general framework for managing or governing an emergency response that incorporates some basics for different scenarios. Depending on the scope of the organization, implement regional or office/facility-level differences. Maintaining an effective communication system is also critical, both from a logistical standpoint and to constitute a plan for maintaining a safe working environment. Conducting an after-action report or exercise to identify gaps in contingency planning is also recommended, as it allows for improvement of procedures and lends itself to greater organizational resilience.

Natural disasters are increasingly creating both business continuity and security concerns around the world. This trend is seen intensifying in 2021, given the ongoing disruption from COVID-19 combined with repeated storms, earthquakes, and other types of natural disasters.

Advisor Insight

Paul Raw
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Disaster management and emergency response cycle

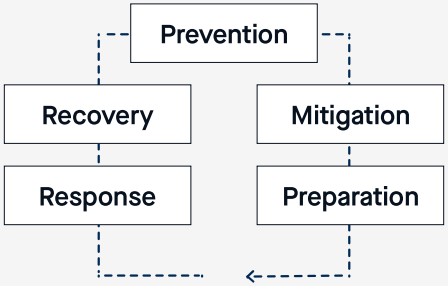
As we approach our disaster seasons around the world, clearly the impact of COVID-19 will continue to disrupt planning cycles and disaster management capabilities. In many cases, the cumulative effect can be managed by taking the capabilities we have developed and applying a change management approach to identifying new risks. Then we must build strategies to mitigate them. The critical resource we can't control, however, is time. If we delay acting, it is quite possible we will run out of time to develop and implement effective disaster management plans.

If we look at the disaster and emergency management cycle, three of the five elements are pre-event measures that can and should be developed now. Action taken now can reduce the impact of events and potentially save lives and money for communities, organizations, and individuals.

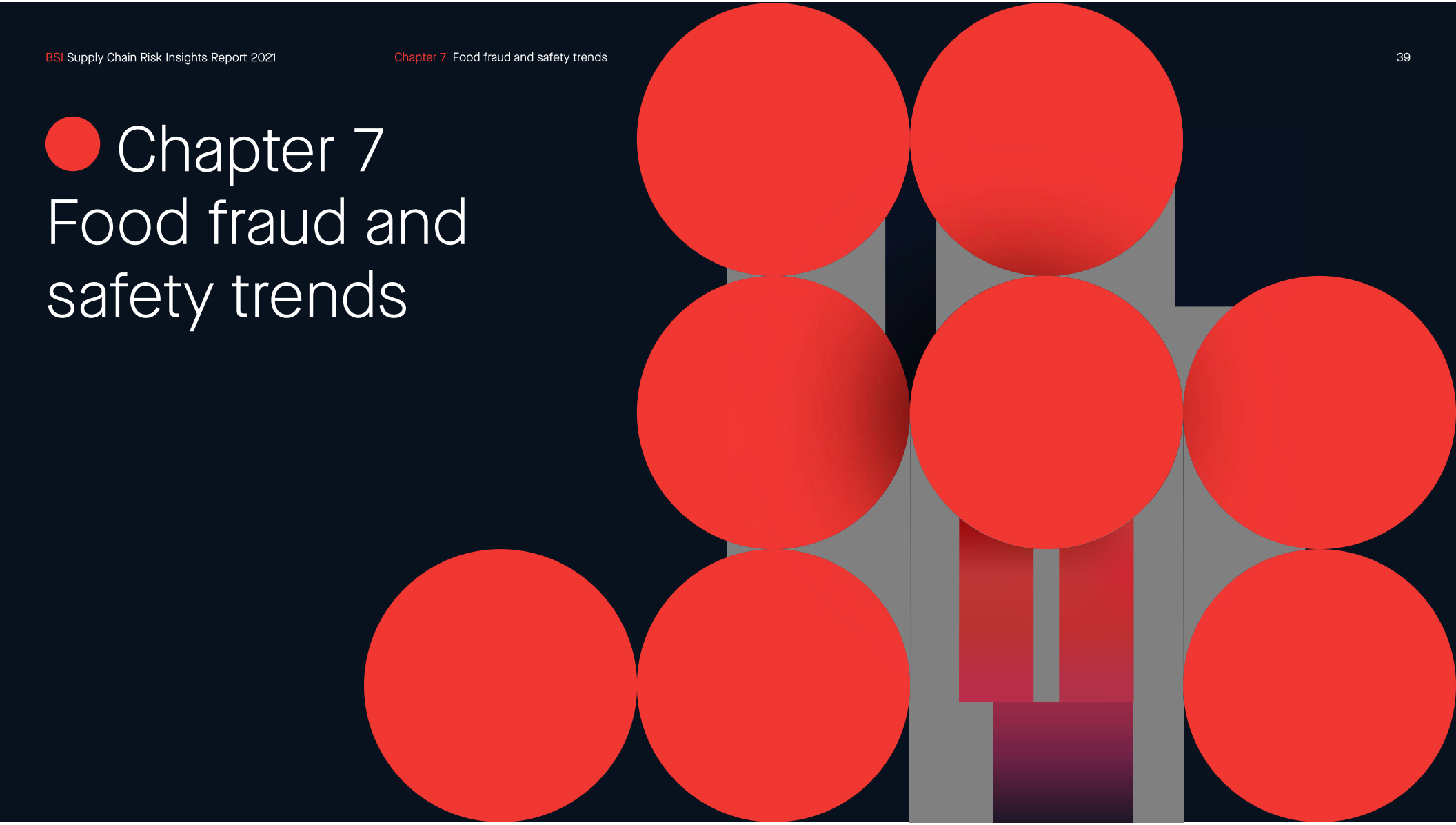
Prevention strategies include removing yourself or your organization from the impact area of disasters. Where this isn't possible, take actions to reduce the impact (commonly, moving resources to safe harbors, stockpiling, and/or setting up secondary infrastructure). The preparation phase includes developing and implementing strategies for the risks that remain present, to further reduce the impact of the event. For a hurricane, this could include the fortification of facilities; for wildfires, it may include cutting back foliage and scrub and setting up evacuation bunkers. As the final phase of the disaster management cycle before the event arrives, it is the last opportunity to evacuate.

The response phase is initiated by the onset of the event itself and should result in seamless and timely response measures as the event unfolds. The key to effective response is the identification beforehand of risks and development of those insights into decisive actions. Beyond the development of effective response plans, flexibility is a tremendously powerful tool in the arsenal of resilient communities, organizations, and individuals. This level of flexibility and positive action can be achieved proactively. Train and give staff a clear understanding of desired outcomes, constraints, and resources available. Also ensure effective communication so that all stakeholders can inform all parties of the changing situation, actions taken, and areas of success or failure in the disaster management plan.

For those organizations that embrace the change and seek to identify and satisfy changing needs, 2021 will offer tremendous opportunity. For those unable to adapt to the changing environment, the forecast is less certain.



Chapter 7 Food fraud and safety trends



Fraudulent and unsafe food to continue to challenge supply chain resilience

- The COVID-19 pandemic initially led to panic buying, stockpiling, and overall disruption to food supply chains in well-developed countries; while these countries were able to manage the problem, it did expose flaws in global food supply chains that criminals could use to introduce fraudulent food into legitimate supplies
- The adoption of alternative sources during a time of reduced ability to audit for best-practices further exacerbate this exposure to food fraud and posed challenges for the safety of products
- Although these challenges came to the forefront during the spread of COVID-19, the same vulnerablities existed prior to the spread of the virus, suggesting that the globalized food supply chain is susceptible to similar issues of fraud in 2021 and beyond.

Food fraud is an increasingly difficult challenge to tackle that can have major ramifications for the resilience and integrity of brands. The spread of COVID-19 last year only served to exacerbate this trend, as the spread of the virus highlighted vulnerabilities in food supply chains that criminals could exploit to introduce fraudulent food into legitimate supplies.
Due to a range of reasons, including labour shortages and movement restrictions, food organizations were unable to secure supplies needed to meet shifts in demand, particularly during the early stages of the pandemic in which panic-buying and stockpiling were common. However, this adoption of new suppliers took place during a time in which the ability to physically visit and work with these organizations to ensure best practice was limited, exposing supply chains to the potential risk of fraudulent food entering legitimate supplies through disingenuous companies looking to cut corners.

General disruption to food supply chains also contributed to a scarcity of raw materials and products that drove prices slightly higher but nonetheless increased the incentive for criminals to produce and distribute fraudulent food. A decreased government capacity to inspect food shipments during the spread of COVID-19 further increased opportunity for criminals to produce or supply fraudulent food, as many agencies were either resource-limited or following altered procedures to observe protocols aimed at reducing the spread of the virus.

While these issues above were certainly underscored during the spread of COVID-19, these same vulnerabilities existed in food supply chains prior to 2020 and continue to exist now, indicating that food organizations will continue to be susceptible to fraud in 2021 and beyond. Part of the challenge lies in the globalization of food supply chains, which sources inputs from an array of countries that may or may not have a robust framework and enforcement apparatus available to combat fraudulent practices. According to a 2020 report from the Food and Agriculture Organization of the United Nations, “trade in food and agriculture has more than doubled in real terms since 1995. Emerging and developing countries have become active participants in global markets and they now account for about one third of global trade.”[10] In addition, other factors including the threat of cargo theft and supply chain corruption have correlations with the risk of food fraud and the sourcing of products from a broader range of countries that may be susceptible to these threats further exposes organizations to food fraud.

Part of the challenge lies in the globalization of food supply chains, which sources inputs from an array of countries that may or may not have a robust framework and enforcement apparatus available to combat fraudulent practices.

[10] http://www.fao.org/3/cb0665en/CB0665EN.pdf

Food fraud risks highlighted in 2020

Throughout most of 2020, especially between April – September, criminals increasingly stole food, beverage, alcohol, and tobacco commodities. This was likely due to their increased value as a result of panic-buying, stockpiling, and shortages, along with ease of sale on the black market. The increasing value of these items created a greater vulnerability for theft, but also put these commodities at an elevated risk for counterfeiting and food safety violations.

Countries such as India and Mexico experienced large upticks in food fraud during the year, while multiple countries dealt with significant issues tied to counterfeit alcohol production. Between July – September, several food safety incidents occurred in India and the country experienced a prevalence of spurious liquor that killed at least 38 people in the Punjab region. Turkey, Brazil, and Mexico all reported criminals increasingly producing and distributing counterfeit alcoholic beverages. The ramifications from counterfeit and fraudulent consumable products are severe and highlight the importance of inspections and tight controls within production facilities. The risk of corruption by individuals working in a supply chain tends to correlate with the risk of food fraud. BSI analyzed that approximately 85 per cent of countries with a high risk of supply chain of corruption also have a high risk of food fraud. Recently, the Malaysian halal meat scandal[11] epitomized this ongoing issue. Adulterated or mislabeled non-halal goods entered factories without inspections and criminals within the supply chain repacked them with halal-certified meat and fake halal logos. Such incidents of food fraud propagated by insiders in the supply chain can involve lower-level employees as well as executives and underscore the need for vetting suppliers and auditing supply locations to ensure compliance and mitigate corruption.

[11] https://www.bloomberg.com/news/articles/2020-12-30/fake-halal-meat-scandal-in-muslim-majority-malaysia-fuels-anger