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From Production to Patients

Optimizing the Last Mile of the Life Sciences Supply Chain

A survey of 150+ Supply Chain, Packaging & Labeling, Serialization & Temperature/Data Monitoring Executives from the Pharmaceutical, Biotech and Life Sciences industries on the challenges, emerging trends and opportunities for growth along the last mile of the supply chain.

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About This Report

Though life sciences companies see value across the full the supply chain, it's the last mile that matters the most to the customer. When customers can't get what they want when they want it due to product loss, theft, spoilage, counterfeiting or other disruptions, it can be incredibly damaging to a company's brand and bottom line.

Optimizing that last mile involves careful coordination between a complex network of partners, distributors, outsourcers, wholesalers, etc. to ensure the right product reaches the right consumer at the right time. A difficult

task for any company but especially so for life sciences companies who's supply chains are highly regulated and reach a customer base rivaled by few.

With this survey, we aim to demystify the last mile of the pharma supply chain (final packaging to customer delivery) by identifying potential areas of improvement, trending solutions and best practices. Our goal is to provide the industry with new set of benchmarks, data and expert analysis to help accelerate their supply chain optimization journey.

Perfecting the Last Mile: The Supply Chain Perspective

Where do you fall on the supply chain maturity curve?

Supply Chain Visibility: Everybody Wants It But Few Have It

As defined by **Techopedia**, supply chain visibility (SCV) is the “trackability or traceability of product orders and physical product shipments from the production source to their destination. The objective of SCV is to enhance and empower the supply chain by making information easily accessible to each and every stakeholder, including customers.” Though **GEODIS’** 2017 Supply Chain worldwide survey found that supply chain visibility is a top priority for global supply chain leaders across all industries, only 6% of companies have actually achieved full end-to-end supply chain visibility. Based on our findings, it seems that the life sciences industry quite a bit behind when it comes to achieving full supply chain visibility.

Though most of our life sciences respondents have achieved visibility into specific areas (i.e. warehousing, customers, etc.), less than 3% have achieved full transparency across the last mile of the supply chain. With this in mind, it should be no surprise that inaccurate planning & forecasting (19%) and lack of internal systems integration & visibility across functions (19%) were listed as the 2 of the most common causes of disruption across the last mile. Furthermore, 19% of respondents replied that end-to-end supply chain visibility enablement was one of their top 3 strategic priorities for 2018/2019 and another 41% listed Supply Chain Management (SCM) tools as their top areas of investment in the near future.

How much money are you losing due to product spoilage?

The War Against Supply Chain Product Spoilage

The number two supply chain disrupter? Product spoilage due to failure of temperature control systems (17%). Now that drugs have evolved past traditional chemical-based, small-molecule therapeutics to more complex and often more effective large-molecule biologics, there are more temperature sensitive drugs on the market than ever before. In fact, 80% of the top biopharma products introduced in the past 2-3 years have

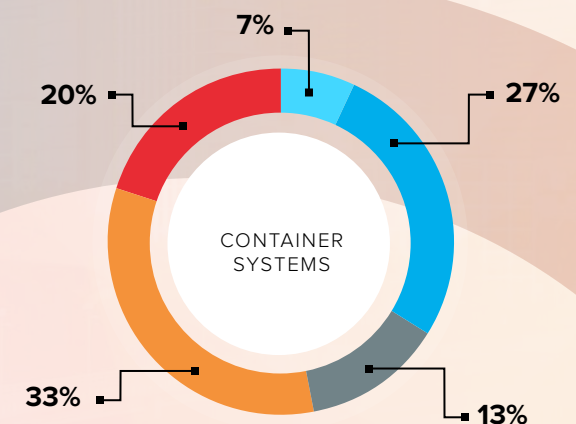
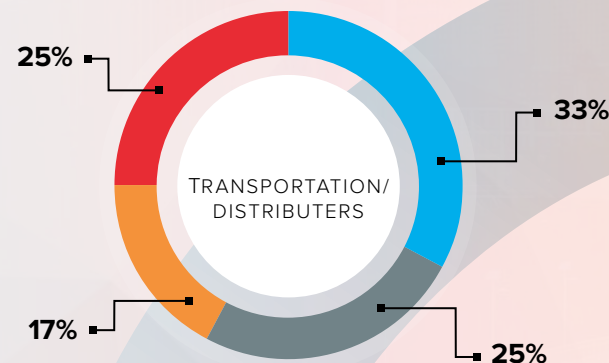
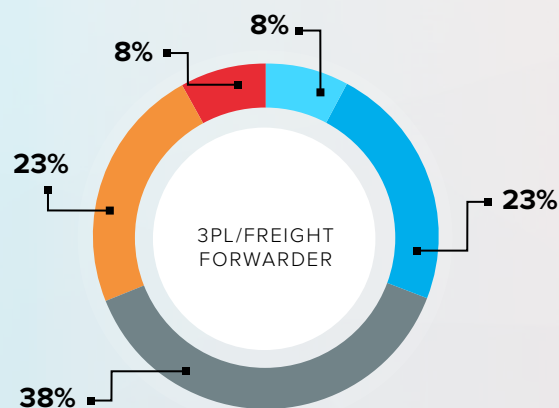
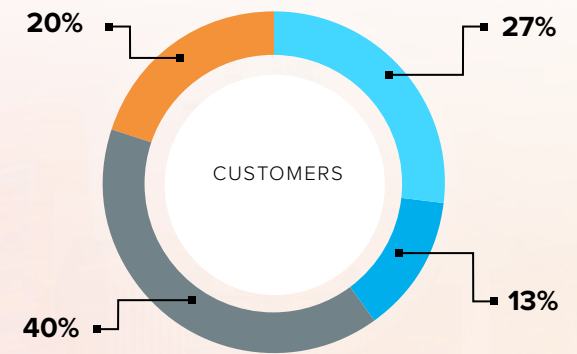
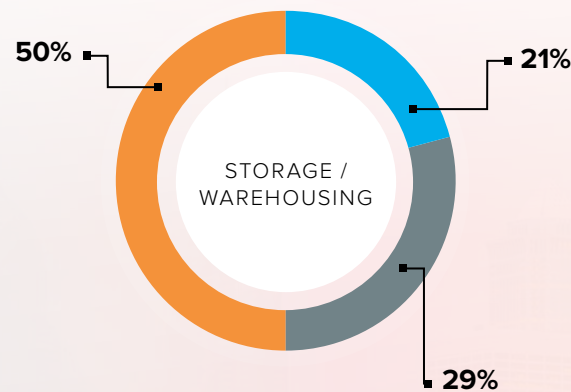
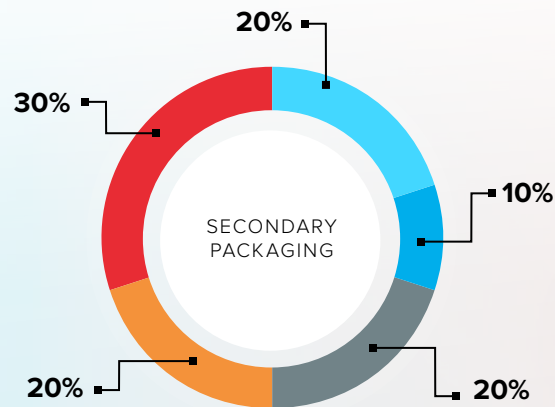
been temperature sensitive. To compound this issue, these drugs tend to be considerably more expensive (a single pallet load of biosimilar can be easily worth upwards of \$1 million; a single consignment worth \$50 million). As a result, the top investment area for our respondents over the next year was temperature control and monitoring systems (16%).

From Production to Patients: *Supply Chain Insights*

Results from our 2018 Survey

To what degree do you have visibility into the following tiers of your company's supply chain?

Zero Visibility Some Visibility Good Visibility 100% Visibility I don't Know

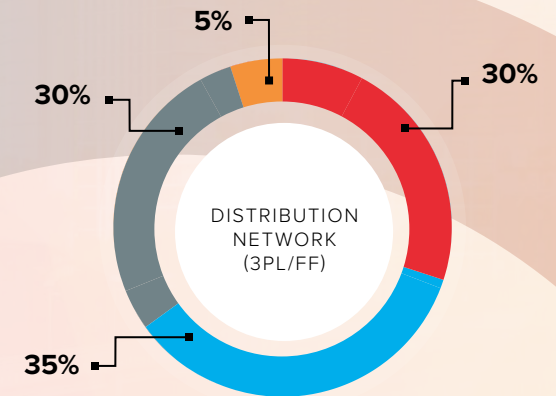
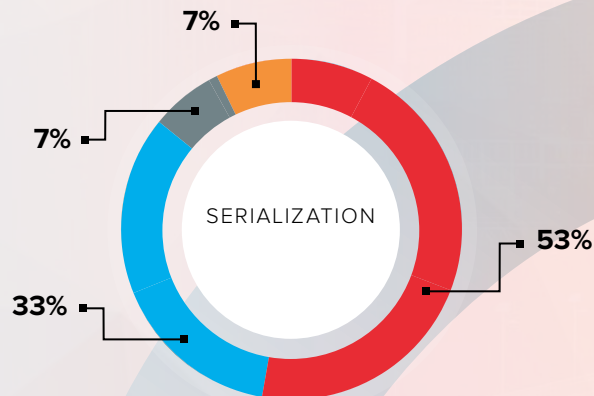
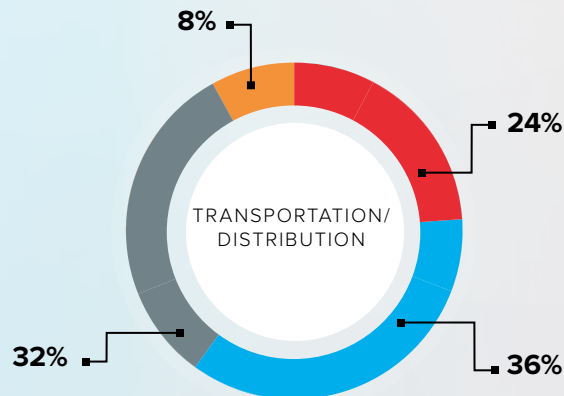
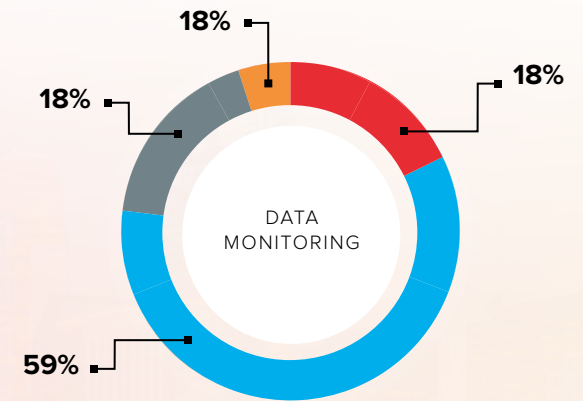
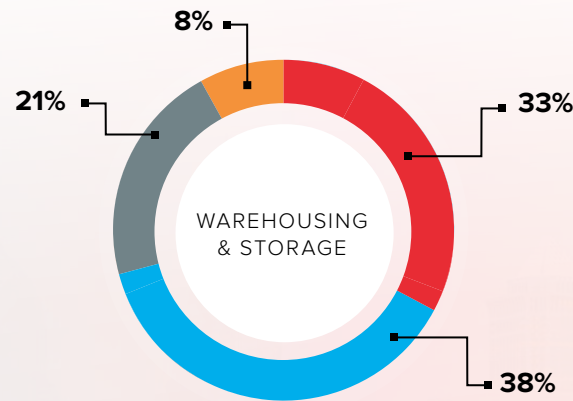
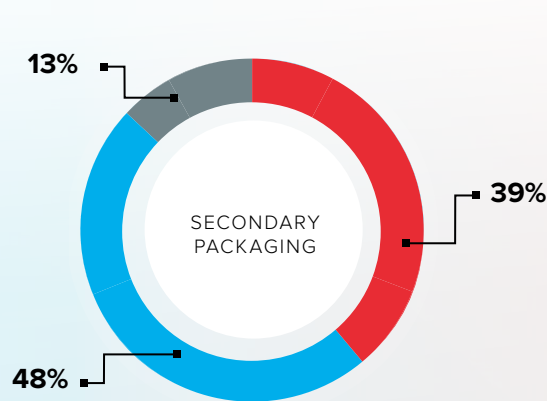


From Production to Patients: *Supply Chain Intelligence*

Results from our 2018 Survey

How many supply chain incidents or failures did your organization experience over the past year?

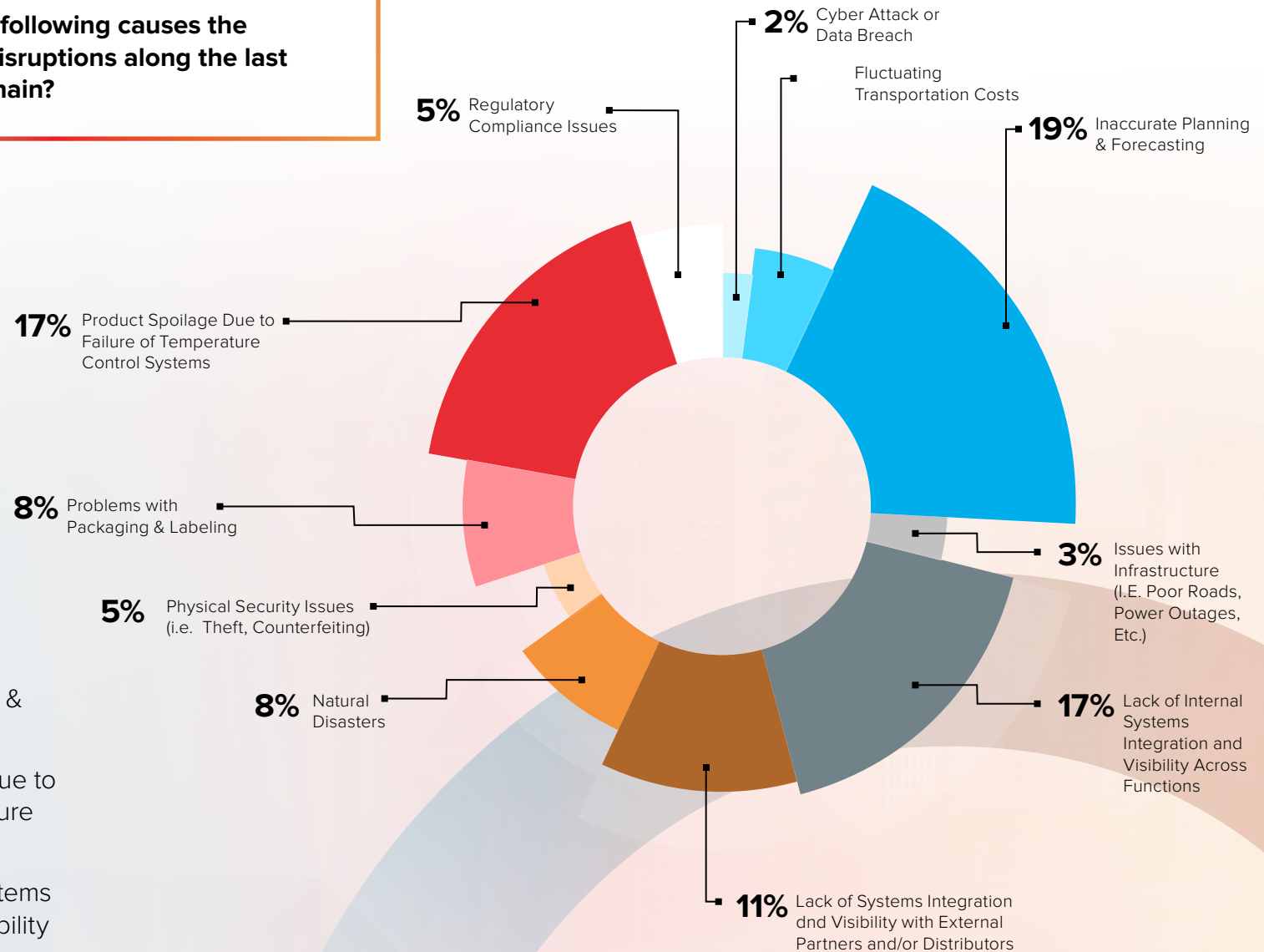
Zero 1 to 5 5 to 20 20+



From Production to Patients: *Supply Chain Intelligence*

Results from our 2018 Survey

Overall, what of the following causes the most supply chain disruptions along the last mile of the supply chain?



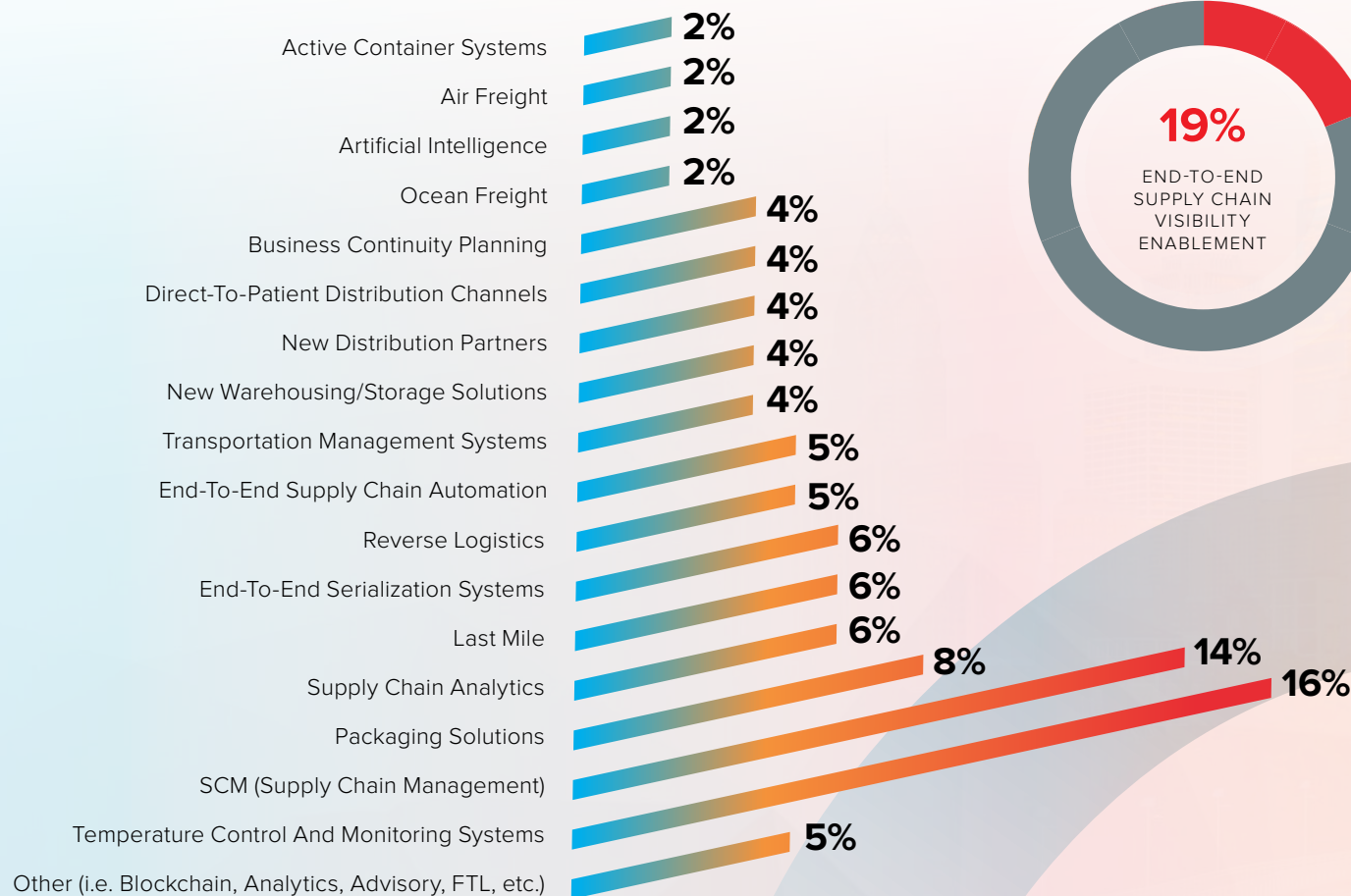
Top 3 Last Mile Disrupters

- 1 Inaccurate Planning & Forecasting
- 2 Product Spoilage Due to Failure of Temperature Control Systems
- 3 Lack of Internal Systems Integration and Visibility Across Functions

From Production to Patients: Supply Chain Intelligence

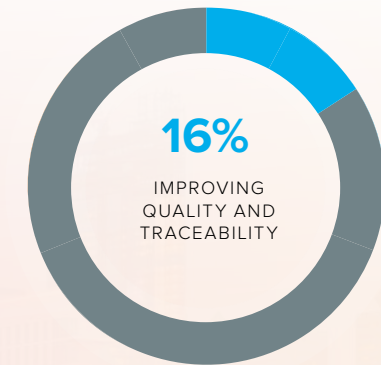
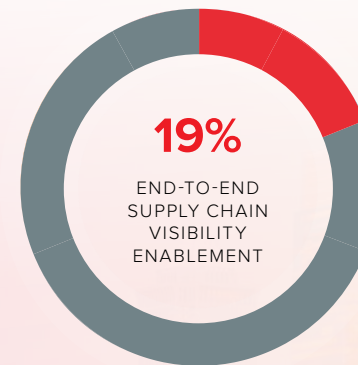
Results from our 2018 Survey

When it comes to optimizing supply chain performance across the last mile, what is your top improvement priority?



Top 3 Responses

How are you hoping to benefit from these improvements?



The Big Chill

Temperature Control/Data Monitoring Perspective

Temperature Control and Data Monitoring are critical for ensuring sensitive pharmaceutical product is kept temperature compliant no matter what. As mentioned earlier in this report, a single shipment of high value product such as biologics can easily be worth tens of millions of dollars. Considering the significant financial as well as patient safety risk, the margin for error here is zero.

Though the available temperature control and data monitoring solutions have evolved significantly over the years, **65%** of Temperature/Data Monitoring leaders reported at least one Temperature/Data Monitoring-related

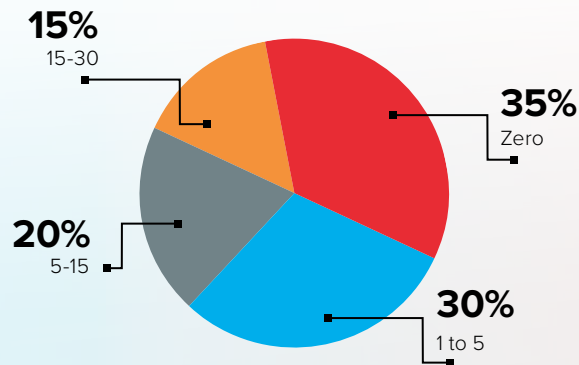
supply chain disruption over the past year. Furthermore, disruptions in this area seem to be more costly than others (**10%** of respondents have lost over \$1 Million in revenue due to Temperature/Data Monitoring-related delays/disruptions).

The number one cause of the disruptions? Human error (**27%**). One commentator wrote that “incorrect placement of data loggers, incorrect handling, incorrect use of thermal blankets” were all major causes of product spoilage.

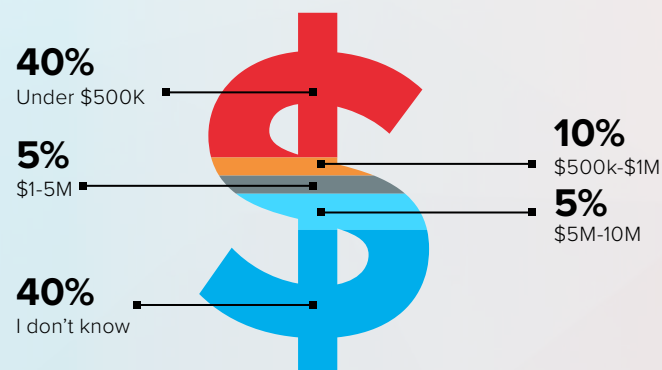
Temperature/Data Monitoring *Intelligence*

Results from our 2018 Survey

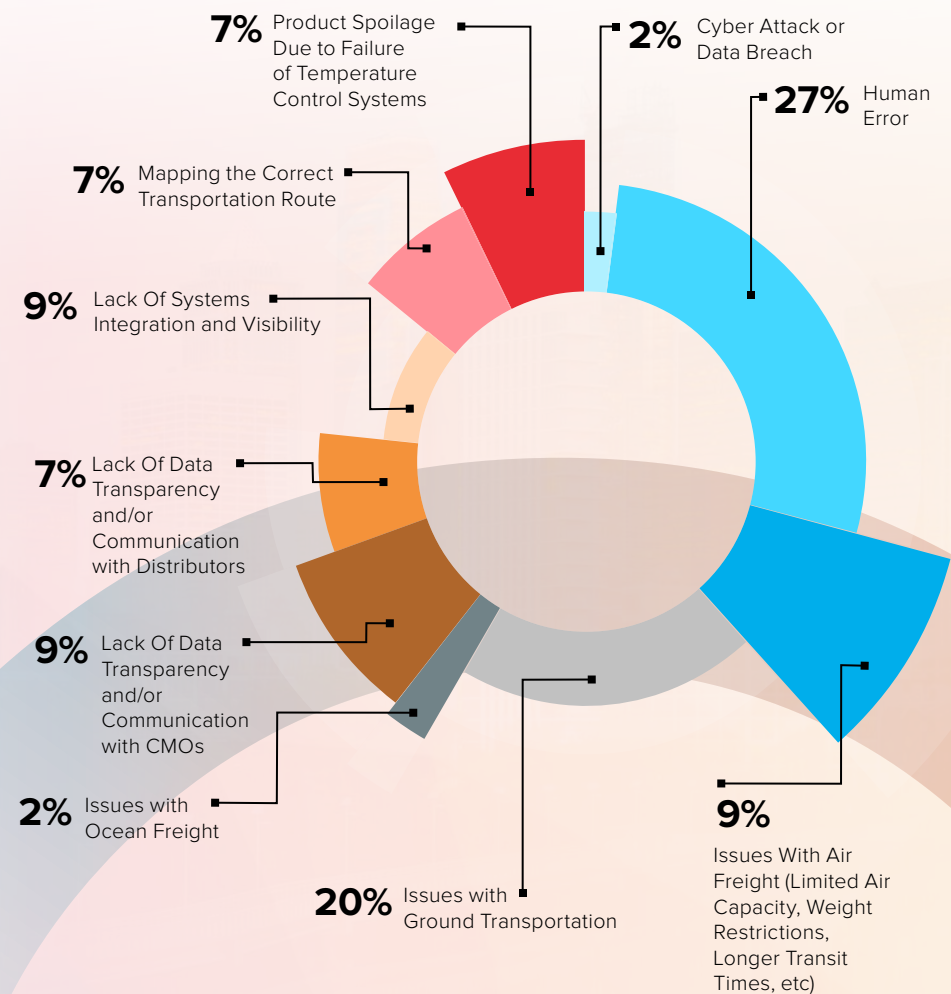
In the past year, how often did Temperature/Data Monitoring-related problems delay or disrupt the supply chain?



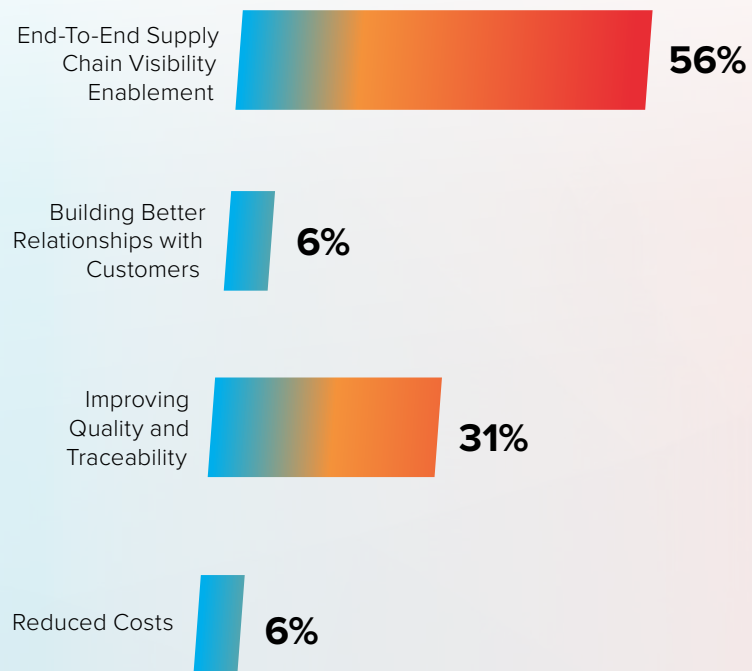
At your company, how much revenue would you estimate is lost due to serialization errors, inefficiencies and other disruptions?



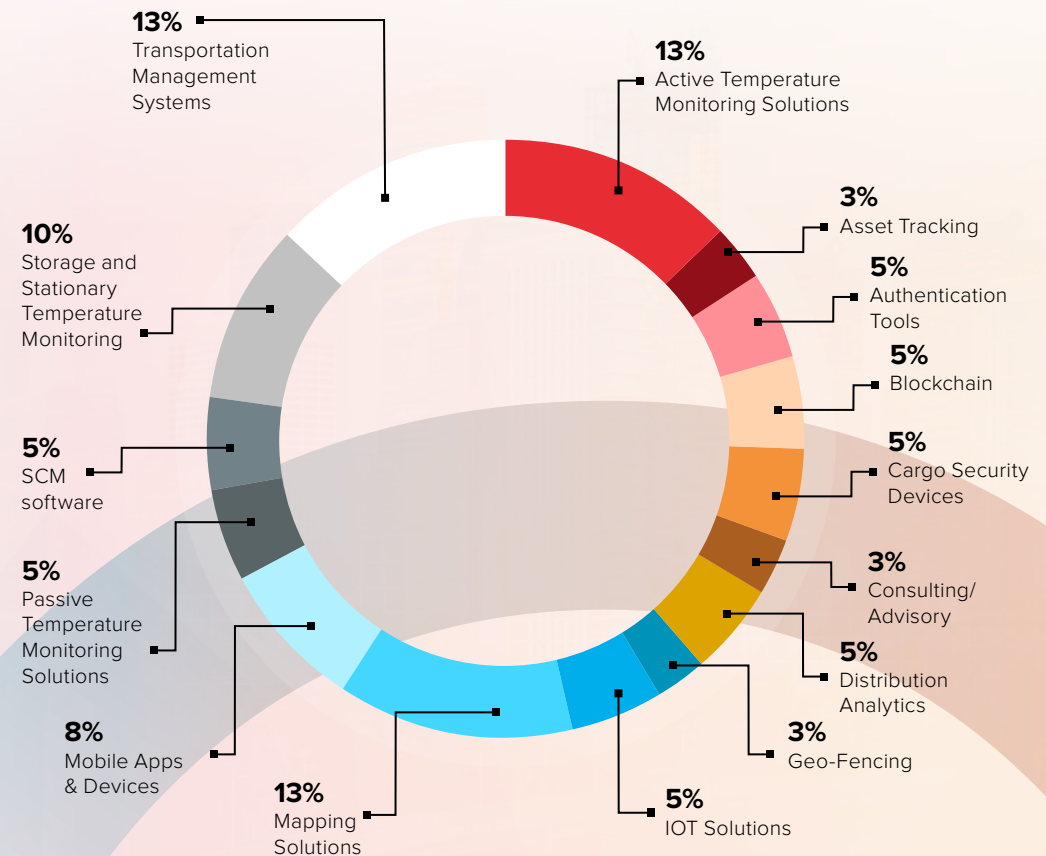
When Temperature/Data Monitoring incidents or failures did occur, where the top 3 most common causes:



How are you hoping to benefit from these improvements?



What are your company's top 3 priorities for 2018/2019 when it comes to improving Temperature & Data Monitoring:



Breaking Down the *Last Mile*

The Packaging & Labeling Perspective

According to *Global Pharmaceutical Packaging*, 12th Edition, a 2018 report by the **Freedonia Group**, due to the growing demand for pharmaceuticals coupled with increased emphasis on product packaging the Global pharmaceutical packaging demand is projected to expand 6.0% per year to \$112 billion in 2021. With that in mind, it should be no surprise that our respondents are increasingly focused on optimizing and investing in packaging & labeling.

Though the secondary packaging process seems to be fairly optimized (only **13%** of respondents reported experiencing more than 5 secondary packaging related supply chain disruptions over the past year), **42%** of the packaging leaders surveyed have experienced at least 15 significant disruptions during the post-production packaging & labeling process that have caused significant supply chain delays over the past year. That percentage is significantly higher than our Temperature/Data Monitoring

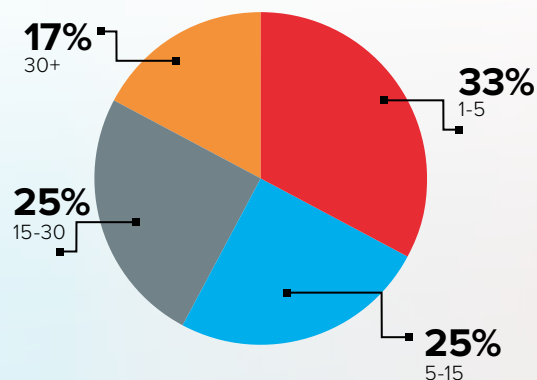
and Serialization respondents at **15%** and **6%** respectively. Fortunately, the delays on the packaging side tend to be less costly than the other areas of the supply chain. Only **16%** of packaging & labeling respondents estimated they lost more than \$500K annually due to disruptions in the packaging & Labeling process.

The number one cause of these disruptions? Assembly Issues (**33%**). Between the new Falsified Medicines Directive (FMD) and the Drug Supply Chain Security Act (DSCSA) combined with the increased use of contract manufacturers, smart packaging and small batch manufacturing, the pressure as well as the complexity of ensuring medicines are properly packed/labeled has never been more immense. To help combat many of these issues, **21%** of respondents are looking to invest in *end-to-end serial solutions* to more effectively track product, ensure compliance and take another step towards full supply chain visibility.

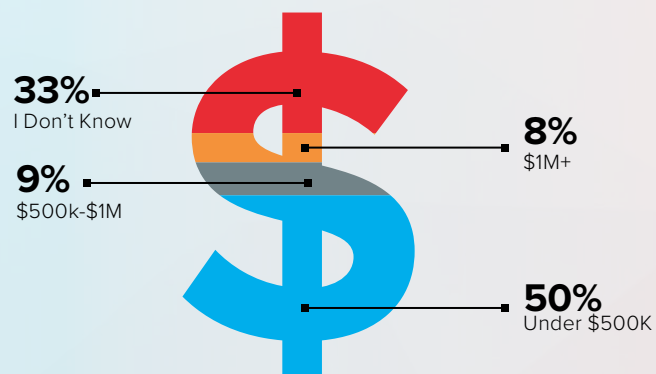
From Production to Patients: Packaging & Labeling Intelligence

Results from our 2018 Survey

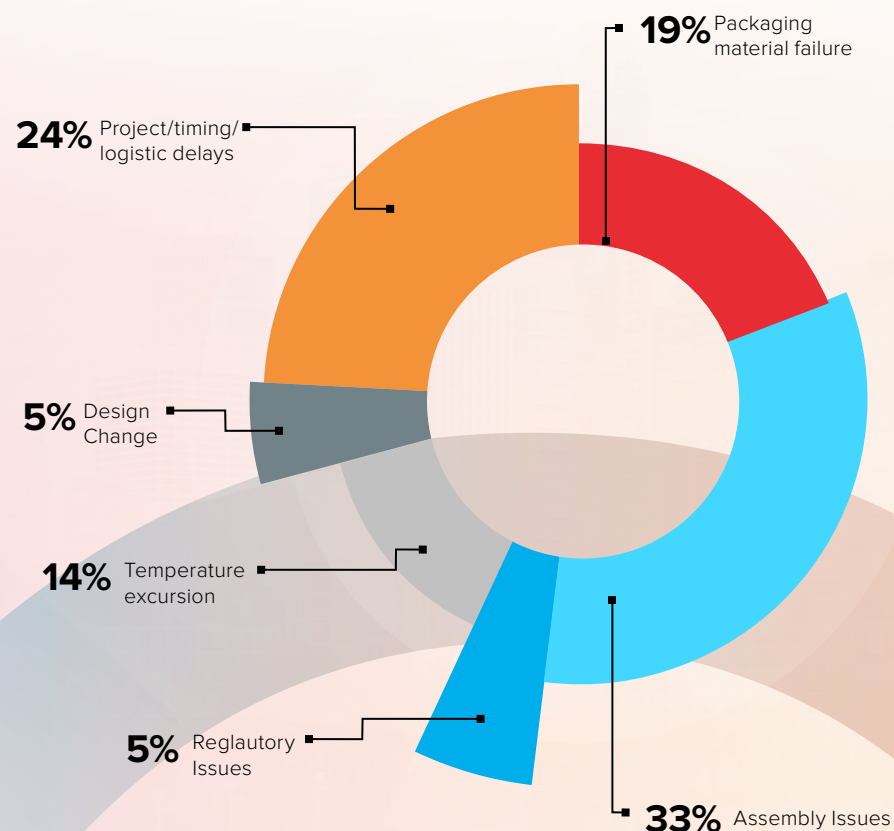
How many times per year would estimate that disruptions in the packaging & labeling process causes significant supply chain delays?



At your company, how much revenue would you estimate is lost due to errors, inefficiencies and other disruptions that occur during the packaging & labeling process?



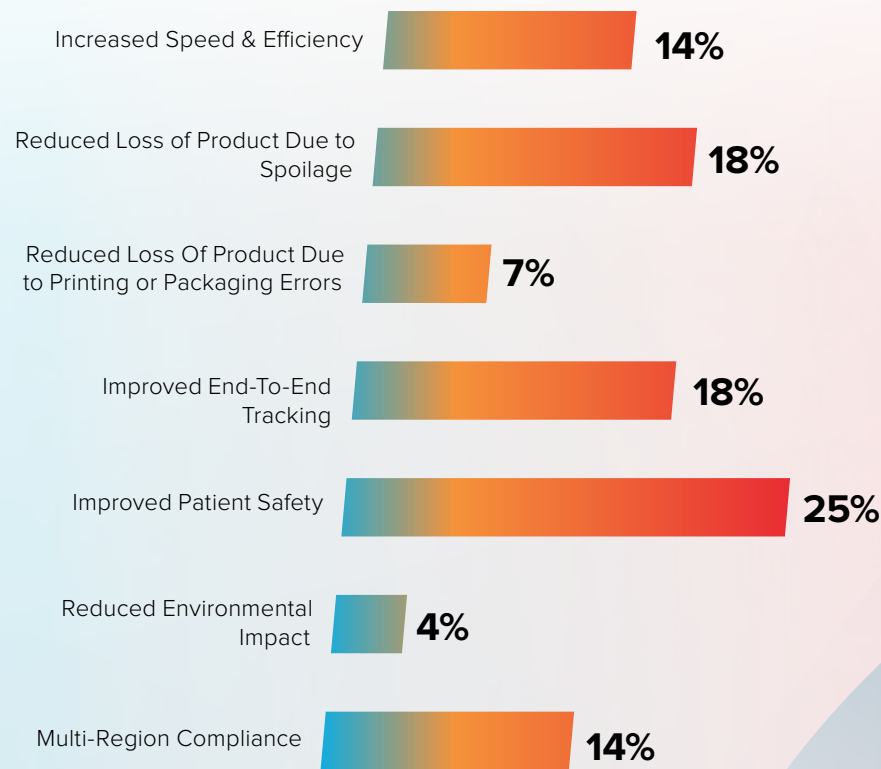
When disruptions do occur, what is typically the cause?



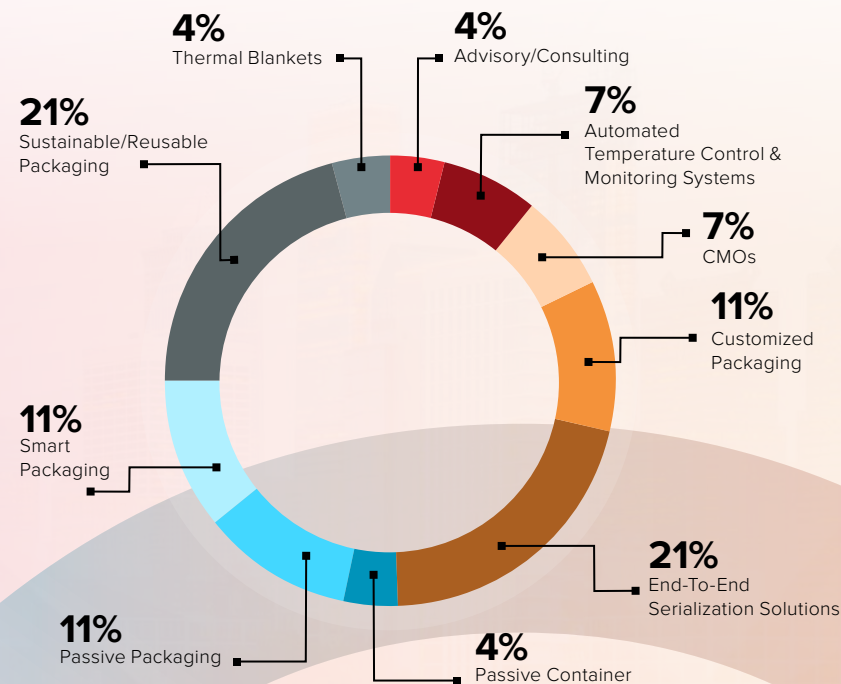
From Production to Patients: Packaging & Labeling Intelligence

Results from our 2018 Survey Cont.

How are you hoping to benefit from these improvements?



What is your top area of improvement when it comes to the Packaging & Labeling Process?



Driving Value Beyond Compliance

The Serialization Perspective

Over the past few years, multiple new serialization and transaction data collection regulations have been established. In the US, the Drug Supply Chain Security Act (DSCSA) was put into effect in order to improve supply chain traceability, ensure drug legitimacy and streamline recalls. A multiple phased rollout of the DSCSA began in 2015 and, over an eight-year period, will be fully implemented by 2023. Similar to the DSCSA, the EU's Falsified Medicines Directive (FMD) and the EU Delegated Regulation (DR) gives companies until February 2019 to start serializing products, recording transactions as each product moves through the supply chain and verifying the legitimacy of the products.

Though, as of mid-2017, only a third of pharma companies were "very ready" for the November 2018 deadline for

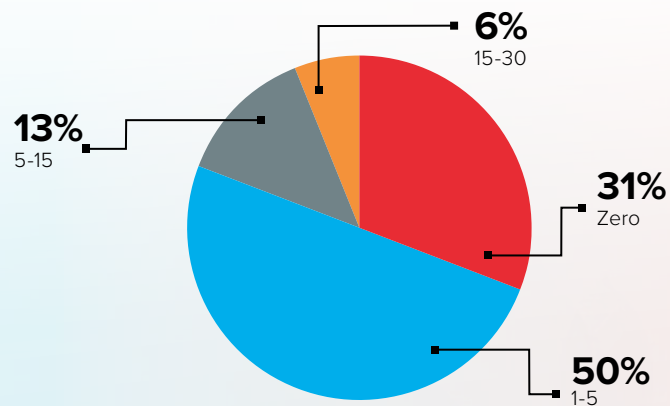
100% serialized product according to a 2017 survey sponsored by **TraceLink**, problems during the serialization process seem to cause the least amount of supply chain disruptions out of all of the areas we surveyed (**81%** experience 0-5 incidents per year). That being said, **50%** of respondents listed *end-to-end serialization solutions* their top investment priority for the next year.

Another interesting trend we noticed is that **50%** of respondents admitted that they did not know how much money was lost per year due to serialization-related disruptions. In addition, a number of respondents wrote in that demonstrating ROI and building a business case for end-to-end serialization solutions was one of the biggest challenges they face.

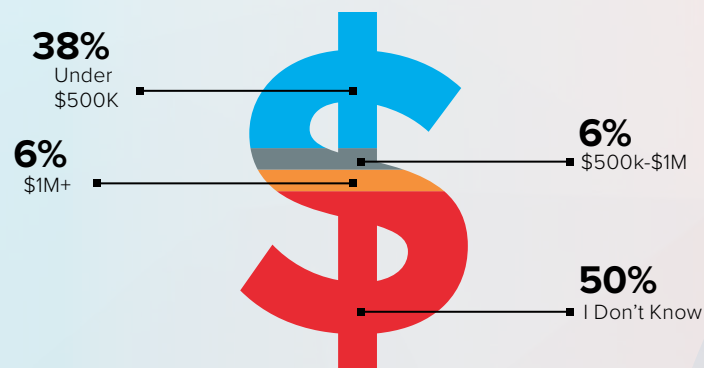
From Production to Patients: *Serialization Intelligence*

Results from our 2018 Survey

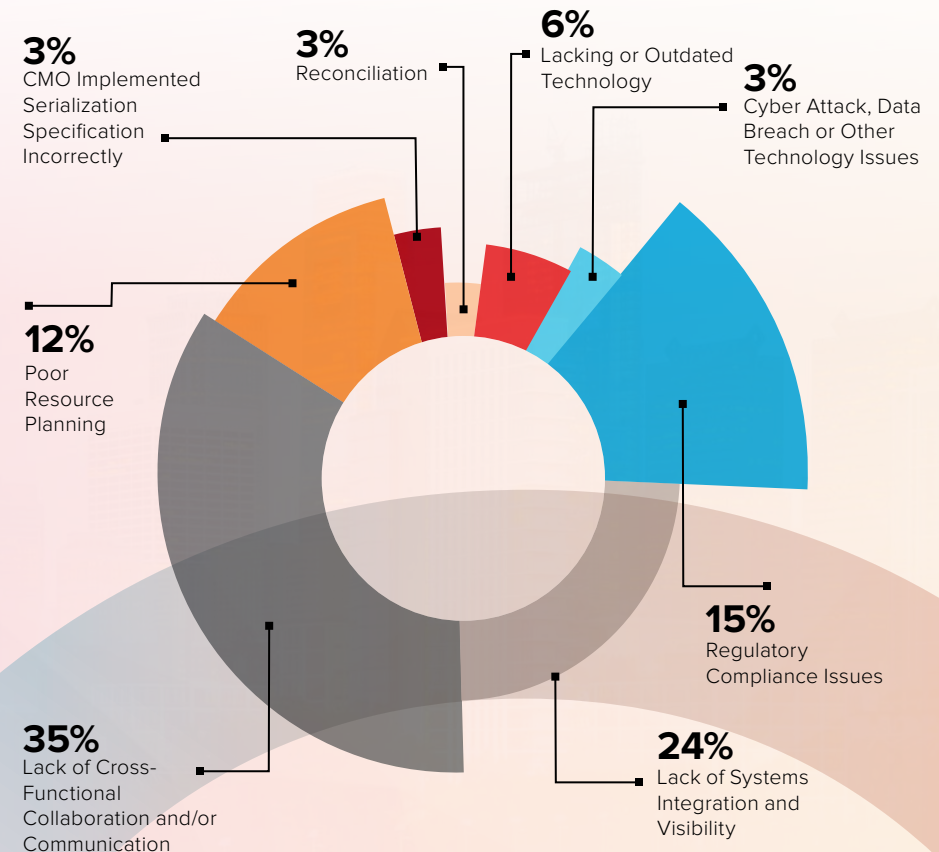
In the past year, how often did problems in the serialization process delay or disrupt the supply chain?



At your company, how much revenue would you estimate is lost due to serialization errors, inefficiencies and other disruptions?



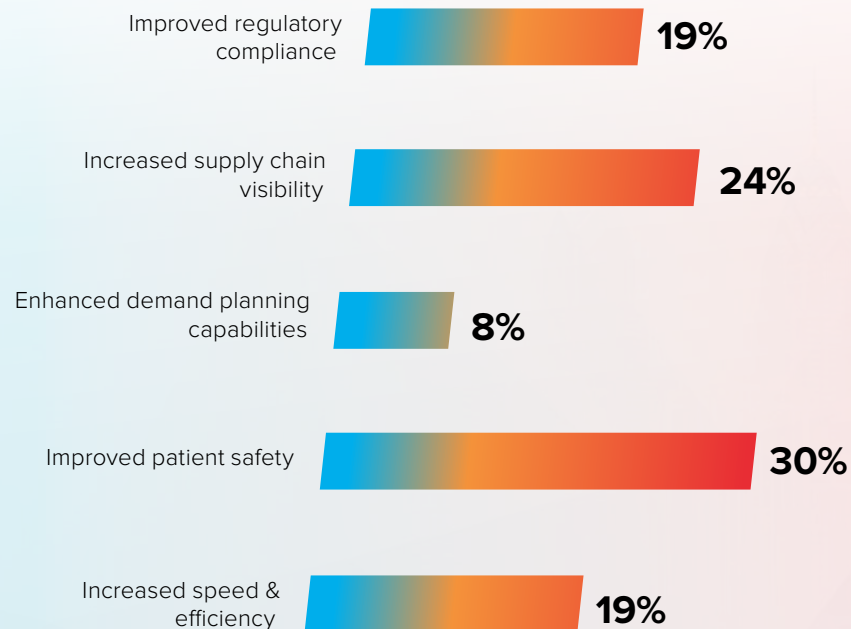
When serialization-related incidents do occur, what is most often the cause?



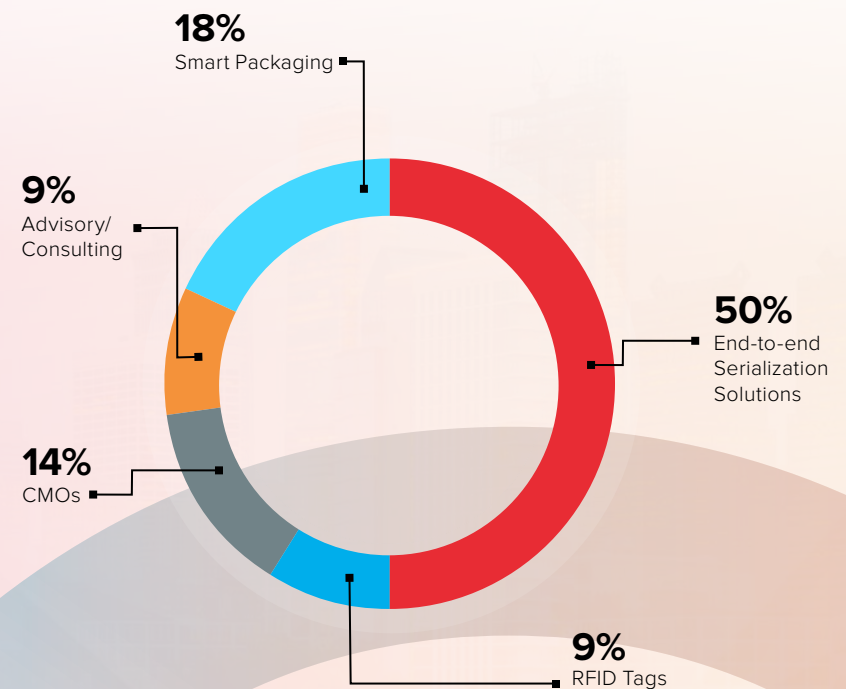
From Production to Patients: *Serialization Intelligence*

Results from our 2018 Survey Cont.

How are you hoping to benefit from these improvements?



Is your company looking to improve the serialization process? If so, what is your top improvement priority?





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