About ChainLink Research

ChainLink Research, Inc. is a Supply Chain research organization dedicated to helping executives improve business performance and competitiveness through an understanding of real-world implications, obstacles and results for supply-chain practices, processes, and technologies. The ChainLink Inter-Enterprise Model is the basis for our research; a unique, real-world framework that describes the multi-dimensional aspect of the links between supply chain partners.

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Executive Summary

Many experts predict that it is only a matter of time before the H5N1 Pandemic Flu arrives. And, when it does come, the impact on global business will be devastating—failed operations and business shutdowns, due to the collapse of business and transportation infrastructures, because key human resources have refused or are unable to come to work. Businesses will be unable to obtain supplies to continue operations. As consumer priorities change, many goods will become scarce. Entertainment and luxury items will fall out of favor as the need for survival goods grows. There will be decreased productivity due to fear, stress, high absenteeism, low morale, enforced isolation, and depletion of the work force. There will be restricted face-to-face contact, and public service shutdowns of gathering places in an effort to reduce personal contact. Many economists predict a severe economic depression, depending on the length and severity of the pandemic.

We should be paying close attention to current events that are indicators of a pandemic approaching. The following prestigious organizations are very much paying attention to these indicators — World Health Organization (WHO), the Centers for Disease Control (CDC), the Infectious Diseases Society of America, the Homeland Security Council, the State Department, the Department of Health and Human Services, the Department of Agriculture, the Department of Defense, and the United Nations, all of whom have begun to work on coordinated Pandemic Influenza Preparedness plans. The World Bank said the threat from the H5N1 Avian Flu virus infecting humans could cost the global economy up to $2 trillion, sharply raising earlier estimates.

<table>
<thead>
<tr>
<th>CURRENT WHO PHASE OF PANDEMIC ALERT (NOV 2006)</th>
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</thead>
<tbody>
<tr>
<td><strong>Interpandemic phase</strong></td>
</tr>
<tr>
<td>New virus in animals, no human cases</td>
</tr>
<tr>
<td><strong>Pandemic alert</strong></td>
</tr>
<tr>
<td>New virus causes human cases</td>
</tr>
<tr>
<td>Pandemic</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Pandemic</td>
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</tr>
</tbody>
</table>

Table 1 — Current Who Phase of Pandemic Alert
Some businesses are out ahead of this risk, from a planning perspective, but our research shows that the number is alarmingly low: about 1 in 60. Our survey of over 200 companies included a broad cross section of industries and company sizes, ranging from less than 10 million to over 10 billion dollars in revenues. We discovered not only that many businesses are unprepared, but also that half of those who do have some sort of pandemic preparedness plan in place haven’t invested the effort and dollars necessary for testing their plans. Our research also disclosed that most companies have not been properly informed about how long this type of pandemic could last.

Here are some of the alarming facts:

- **Only 48% of our respondents have some sort of business continuity plan in place**
  - 9.8% of those have included a pandemic preparedness plan in the business continuity plan
  - 63.4% of those with a business continuity plan have NO intention to expand their plans to include a pandemic preparedness plan
  - Approximately 50% of those with plans don’t test them

*In short, less than 2% of the companies who responded to our survey have a pandemic preparedness plan in place, for a pandemic lasting 12 months or more, that is being practiced at least once a year.*

Couple those facts with the government’s message that businesses need to put their own plans in place and not rely solely on the government to help them in the advent of a pandemic, and you begin to see the urgent need for understanding the message, and the implementation methodology that is the meat of this report.

Typically, if you believe that something will occur, you are more apt to make the investment to be ready for that occurrence. Well, not so in this case. The American business community is simply not ready, even though many agree they should be. Another fact from the research:

*35% of companies responding to our survey believe that a pandemic will occur or is likely to occur.*
WHAT YOU WILL LEARN IN THIS REPORT

This report gives you a brief but realistic overview of the pandemic threat, including possible consequences that could impact all enterprises. This section will help drive home the urgency of preparing for the potential risks every enterprise faces. Next, we explain what we hoped to accomplish with this report. We also surveyed the current thought on the critical elements of a preparedness plan, and developed a methodology for companies just starting out on the journey to Proactive Pandemic Preparedness.

Medical Facts—All the Reasons Why Your Employees WILL NOT COME TO WORK What is Influenza? Why is the new one dangerous? Will vaccines save us?

Just How Prepared Are We? An investigative analysis of the current state of readiness.

ChainLink Research Assessment Methodology A step-by-step method to assess demand, and readiness to meet it.

Critical Success Factors What are the things you have to get right?

Sample Approach – Microbix Learn how one company handled Employee preparedness.

Emerging Best Practices What is working? Who’s got it right?

Conclusions Parting thoughts.

So, read on, and find out not only the appropriate methodology to put you and your enterprise at the ever-ready end of the spectrum, but also how to do it in a cost-effective and timely fashion AND in synch with your business partners.

“No one thinks it will happen. Not important enough to worry about. Not a priority, sales and production more important.”

- ChainLink Survey response

“The World Health Organization has created a protocol with six escalating phases of response which serves as the framework for our plan. Our primary goals are to keep our employees as safe as possible, protect our company, its assets and its reputation, and minimize disruption to our customers.”

- ChainLink Survey response

WHEN it gets here, which end of the Preparedness Spectrum do you want to be on?
Medical Facts: Why Your Employees WILL NOT SHOW UP FOR WORK

Influenza A Virus

Influenza A viruses have always infected many different animals. Influenza A viruses normally seen in one species can often cross over and cause illness in another species. This is called mixing, or mutation and this is how new subtypes of viruses are created. These viruses can be highly infective, easily transmissible and very deadly in animals and humans.

Seasonal Flu

In a normal flu season up to 30% of the population can catch the flu. Generally, in the United States, we see anywhere from 20,000– 50,000 deaths each year from the flu. These deaths usually occur in the infirm and the elderly (usually from a secondary bacterial pneumonia infection), and normally many of us think there is little cause for concern.

The seasonal flu is the normal flu we see come around every year, usually starting sometime in the fall and lasting until sometime in the spring. Each year we see slightly different variations of influenza virus subtypes that have been around for awhile, and most of us have some antibodies and immunity to some of these subtypes. So when it comes time in the spring to look at making the next season’s flu vaccine, our influenza specialists usually look at the three most prevalent subtypes we just had and begin to culture these viruses in fertilized eggs, and then combine them to come up with our new flu vaccine for the coming flu season (this is the simple version). The process to make a new vaccine usually takes about six months. The seasonal flu, as we mentioned earlier in our report can target 5 – 30% of the population, and usually makes you feel like hell for about a week or so. Complications arise in people with compromised immune systems and in the elderly. Deaths occur usually from a secondary bacterial pneumonia infection. Getting your flu vaccine each year greatly reduces your chance of getting the flu. The experts who just made the new vaccine are hoping the new subtype virus out for the season will at least be partly covered by the vaccine. The old wives tale about not wanting to get your flu vaccine because you will “get the flu” is just that…a tale. Our current vaccines are made from a “killed” virus…and you will not get the flu, your arm may hurt, but you will still be better off!

A pandemic flu, as we mentioned earlier, occurs when we have those silly birds coming up with a new viral subtype to which we have no antibodies or immunity. The virus goes through several stages until it mixes and mutates to become easily transmissible to hu-
mans…and then we are in trouble. Pandemic simply means it will become a global problem because humans have no defense against a brand new virus, and we never know how lethal these viruses will be until they do finally mutate to become easily transmissible from human to human. Right now H5N1 is looking pretty bad and has influenza scientists, the medical community and governments very worried. More so than they have been with a flu virus in a very long time.

**H5N1 Virus**

Currently on the horizon we have a brand new influenza subtype called Avian H5N1. The H5N1 virus is currently ravaging migratory and domestic fowl populations throughout Asia, Europe, Africa and the Middle East, and shortly will make its appearance in North America, due to the migratory paths of ducks and geese. This new virus has been devastating to domestic and wild fowl and will continue to be endemic in bird populations for years to come. The H5N1 is a relatively new subtype to which humans have no resistance or antibodies.

There have already been over 250 people who have caught the H5N1 virus due to their close proximity to their domestic poultry. The Avian H5N1 virus has proven to be extremely lethal in humans, with an average mortality rate of approximately 58%, and more than 75% in Indonesia.

**H5N1 Avian (Bird) Flu vs. H5N1 Pandemic Flu**

“Avian (Bird) Flu” and “Pandemic Flu” are two completely different issues with very different economic and medical impacts. It is no wonder that we are confused – these terms are interchanged in the media quite often.

**H5N1 Avian (Bird) influenza** is a disease that currently afflicts millions of birds worldwide (the most ever on record) and this has become an enormous problem for many different countries, governments, veterinarians, and poultry farmers. Except for the few very unfortunate people who have caught H5N1 (due to their proximity to their poultry), this remains a problem only for the Avian population.

**H5N1 Pandemic Flu** in humans, when and if this happens, becomes a MAJOR public health issue and can have catastrophic global implications.

We need to approach these very different issues on two fronts. When we think of Avian Flu in the US—and it will be here soon—we need to look at the businesses this will affect most (i.e. poultry farmers, fast food chains, food industry, etc.) and decide how to mitigate their financial losses, and help them do what they can do now to shore up their defenses. When
we look at a human pandemic of H5N1 we need to develop strategies on preparedness not just for businesses, but total preparedness for our “Human Supply Chain.” The more businesses have overall strategies that cover all fronts, the better our country will be able to get through what will be a very difficult time in terms of financial and human loss.

The World Health Organization (WHO), the Centers for Disease Control (CDC), and much of the scientific medical community believe it is only a matter of time before the H5N1 virus mutates into a form that is easily transmissible from human to human. There are several key steps needed in the mutation process, and H5N1 has already made several of them. When it happens, it will trigger a sudden surge and explosive spread of the disease.

This is a simulation of a pandemic flu outbreak by the Los Alamos National Laboratory, hypothetically introduced by the arrival of 10 infected individuals in Los Angeles. Without vaccination, antiviral drugs, or other mitigating strategies, the entire nation becomes infected in a few months, with the pandemic quickly spreading nationwide and peaking about 90 days after initial introduction. Their updated model shows 92 hours to infect EVERY Air Hub City if efficient human-to-human virus mutation is reached. (Blue = 1 or fewer per 1000) (Green = 50 per 1000) (Red = 100 per 1000)

Figure 1—Simulation of Pandemic Flu

This is the type of pandemic the world has not seen since the Spanish Flu of 1918-1919. The Spanish Flu, from an earlier strain of virus (H1N1) is the worst on record, killing more than 500,000 people in the United States and from 40 million to 100 million people worldwide. The mortality rate exploded, from less than 1% to almost 3% of the population. Its primary victims were young healthy people in the prime of life. Scientists believe that what made this flu different was a reaction called “cytokine storm,” which occurs most frequently in the young healthy population, causing a person’s own immune system to overreact and attack vital organs, especially the lungs.
A physician – known only as Roy – assigned to Camp Devens, a military camp close to Boston with 50,000 soldiers, described the situation in the camp as it appeared in late September of 1918. He wrote:

Camp Devens, Mass.
Surgical Ward No. 16
29 September 1918

My dear Burt,
This epidemic started about four weeks ago, and has developed so rapidly that the camp is demoralized and all ordinary work is held up till it has passed....
These men start with what appears to be an ordinary attack of . . . Influenza, and when brought to the Hospital they very rapidly develop the most viscous type of Pneumonia that has ever been seen.

Two hours after admission they have the Mahogany spots over the cheek bones, and a few hours later you can begin to see the Cyanosis (pronounce "Cy-an-no-sis") extending from their ears and spreading all over the face, until it is hard to distinguish the colored men from the white.

It is only a matter of a few hours then until death comes, and it is simply a struggle for air until they suffocate. It is horrible. One can stand it to see one, two or twenty men die, but to see these poor devils dropping like flies sort of gets on your nerves.

We have been averaging about 100 deaths per day, and still keeping it up… We have lost an outrageous number of nurses and doctors, and the little town of Ayer is a sight. It takes special trains to carry away the dead. For several days there were no coffins and the bodies piled up something fierce, we used to go down to the morgue (which is just back of my ward) and look at the boys laid out in long rows. It beats any sight they ever had in France after a battle.
Normally in each century the world has approximately three flu pandemics, with one being severe and the other two relatively mild. This was the case in the last century, when we had two mild flu pandemics in 1957 and 1968, which increased the overall mortality rates throughout the world but not significantly, and still had the elderly and infirm as its primary victims. The Spanish Flu of 1918 was quite different in the fact that its primary victims were young healthy people in their prime.

### Impact of Past Pandemics on the U.S.

<table>
<thead>
<tr>
<th>Pandemic</th>
<th>Estimated U.S. Deaths</th>
<th>Influenza A Strain</th>
<th>Populations at greatest risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918-1919</td>
<td>500,000</td>
<td>H1N1</td>
<td>Young, healthy adults</td>
</tr>
<tr>
<td>1957-1958</td>
<td>70,000</td>
<td>H2N2</td>
<td>Infants, elderly</td>
</tr>
<tr>
<td>1968-1969</td>
<td>34,000</td>
<td>H3N2</td>
<td>Infants, elderly</td>
</tr>
</tbody>
</table>

*Table 2—Impact of Past Pandemics on the United States*

This is what we are seeing with the H5N1 Avian Flu that birds have transmitted to people: they are primarily young people with no previous health problems, and scientists are seeing evidence of cytokine storms in many of the current victims. The recent family cluster case in Indonesia (that the WHO finally conceded spread person to person) has Influenza Experts around the world scrambling to revamp our vaccine production system.

In the table below the Department of Health and Human Services extrapolates the impact of past pandemics on the current U.S. population of approximately 300,000,000, to illustrate what would happen if we faced the same flu with today’s population.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Moderate (1958/68-like)</th>
<th>Severe (1918-like)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness</td>
<td>90 million (30%)</td>
<td>90 million (30%)</td>
</tr>
<tr>
<td>Outpatient medical care</td>
<td>45 million (50%)</td>
<td>45 million (50%)</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>865,000</td>
<td>9,900,000</td>
</tr>
<tr>
<td>ICU care</td>
<td>128,750</td>
<td>1,485,000</td>
</tr>
<tr>
<td>Mechanical ventilation</td>
<td>64,875</td>
<td>745,500</td>
</tr>
<tr>
<td>Deaths</td>
<td>209,000</td>
<td>1,903,000</td>
</tr>
</tbody>
</table>

*Table 3 - Number of Episodes of Illness, Healthcare Utilization, and Death Associated with Moderate and Severe Pandemic Influenza Scenarios*

*Estimates based on extrapolation from past pandemics in the United States. Note that these estimates do not include the potential impact of interventions not available during the 20th century pandemics. Source: Department of Health and Human Services*
Using Table 3 we can compare the earlier flu pandemics with projections for the H5N1 strain of flu:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Moderate (1957/68-like)</th>
<th>Severe (1918-like)</th>
<th>H5N1-like</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness (30%)</td>
<td>90,000,000</td>
<td>90,000,000</td>
<td>90,000,000</td>
</tr>
<tr>
<td>Outpatient (50%)</td>
<td>45,000,000</td>
<td>45,000,000</td>
<td>45,000,000</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>865,000</td>
<td>9,900,000</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Mortality Rate</td>
<td>0.23%</td>
<td>2.10%</td>
<td>2% — 20%</td>
</tr>
<tr>
<td>U.S. Deaths</td>
<td>209,000</td>
<td>1,903,000</td>
<td>1.8m — 18m</td>
</tr>
</tbody>
</table>

*Table 4  H5N1 Projected Mortality*

The direct and indirect health costs alone (not including disruptions in trade and other costs to business and industry) have been estimated to approach $181 billion for a moderate pandemic (similar to those in 1957 and 1968) with no interventions."

- Department of Health and Human Services
CAN VACCINES SAVE US?

The United States has only recently begun to ramp up its vaccine production through a combination of government subsidies and focused research. Billions of dollars have been allocated to finding new and faster ways of making vaccines. Production of a new vaccine for human strains of the H5N1 flu cannot even begin until after H5N1 has mutated into a form that is easily transmissible from person to person. With our current rate of production that puts us several years away from having enough vaccine to vaccinate nearly 300 million people in the United States. We cannot rely on vaccines to save us—it is almost impossible that we will have invented a vaccine and produced enough doses to immunize a majority of the population before the pandemic strikes. Therefore, the appropriate and thorough application of infection control measures remains the key to limiting transmission, delaying the spread of a pandemic, and protecting personnel.

H5N1 PANDEMIC FLU – DEFINATELY NOT YOUR TYPICAL DISASTER

The experts are predicting that the impact of an H5N1 Pandemic is exponentially larger than the previous worst pandemic, and markedly different from other natural disasters.

In a typical disaster, resources from unaffected regions are mobilized to help with recovery. In a pandemic, there are no "resources from unaffected regions" to mobilize – there are no unaffected regions, and it quickly becomes "every region for themselves" and "every company for themselves" and unfortunately can be even "every man for himself."

A natural disaster is over relatively quickly and then recovery and reconstruction begins. In a pandemic, the disaster is extended and unrelenting, which effectively thwarts many efforts to recover.

<table>
<thead>
<tr>
<th>Typical Disasters (Hurricane, Tornado, Landslide, Flood, Earthquake, Blizzard, Tsunami, etc.)</th>
<th>Global Flu Pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geographic Scope</strong></td>
<td><strong>Regional – A few cities, states. Even the Tsunami, as bad as it was, struck only the shorelines.</strong></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td><strong>Over in days at most, usually hours or even minutes in the case of Tsunami or Earthquake</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5— Comparison of Typical Disasters versus Global Flu Pandemic
How Prepared Are We?

Hurricane Katrina didn’t come close to giving us the lessons we will need to apply to our pandemic planning efforts – with one grave exception: a disaster like Katrina will be a drop in the bucket compared to the duration, and the global reach and devastation of a pandemic. A worldwide pandemic will be not only exponentially more deadly, it will also require a significantly different disaster recovery response.

It is this alarming fact that led us to begin our aggressive research on Pandemic Preparedness. Our primary research objectives were:

- to understand what readiness means at the personal, private sector, and government levels
- to find out how ready the average company thinks it should be, compared to how ready it actually is; identify the reasons for the discrepancies; compare their plans to our list of must-haves; and share their lessons learned
- to develop a pandemic preparedness plan that includes what most other plans do not: a methodology for determining an organization’s readiness to survive and sustain competitive advantage during a prolonged widespread public health emergency

It is almost impossible to turn on TV, pick up a newspaper, or search the net without seeing or hearing something about the pandemic. It seems that almost everyone is weighing in with their opinions and suppositions. This has had the positive effect of heightening the public’s awareness of the risk of a pandemic, but it has also created confusion, misinformation, and doubt as to the real facts. We wanted to dispel all doubts and produce a report that could possibly mean the difference between life and death – YOURS, and that of your business!

To get a sense of the current thought in pandemic disaster preparedness, we conducted numerous interviews across a broad spectrum of the population—academia, government, health care—as well as across a very broad range of enterprise sizes and industry types (see Figures 2 and 3, next page).
We realized after our initial survey that there was a significant discrepancy between the perceived need and the actual state of pandemic readiness, so we decided to study the reasons for the discrepancy. We were convinced through our research on flu pandemics that planning was critical, but we needed to identify the major roadblocks that were creating the gap.

Figure 2—What kind of business unit do you represent?

Figure 3—What are your business unit’s annual revenue?
We also realized that even though there are already hundreds of plans out there, there was a major piece missing in most business pandemic preparedness plans: a methodology that would enable an enterprise to accurately assess its readiness to continue operations when faced with the drastic demand (and supply) fluctuations that would be triggered by the worldwide semi-collapse of human, business, transportation, and communications infrastructures.

We also took a key step of adding solid medical and epidemiology talent to our stable of supply chain talent. This combination was critical for including the essential medical elements that would insure the necessary supply chain resiliency in the likely event of a pandemic.

**SURVEY RESULTS**

The bottom line: The results weren’t surprising. Disturbing, yes, but not surprising.

We started with the question of whether the enterprise had a business continuity plan in place and then moved on to determine whether a pandemic preparedness plan was part of that plan. About half (49.3%) of the respondents have a business continuity plan in place, but only 10% of those surveyed have included a pandemic preparedness plan.

Since a plan isn’t effective unless it has been tested, we wanted to determine how many of those with plans in place or being put in place had also created implementation plans to test them out. A little over half (51.6%) of the respondents have some sort of testing plan in place ranging from as frequently as every six months to as infrequently as every year or so.
The last element that we wanted to pursue relative to preparedness is that of duration – just how long will their plan allow for disruption during a pandemic. It should be at least 12 months – this is based on the information in the first section of this report. The survey results showed that 41.9% of those with a plan allow for less than 6 months of disruption.

Figure 5—Have you conducted or do you plan to conduct a test or walk thru with critical personnel and your employees?

Figure 6—How long does your plan take into consideration for the duration of the pandemic...?
Taking each of these results individually may not cause you to pause, BUT if you take the net result of this information, it should cause you to do much more than pause. The net result is as follows:

1.7% (1 in 60) of those enterprises that responded to the survey have a plan in place that takes 12 months or longer into consideration and are testing or have tested the plan.

Now for the last key question in this discussion: how many enterprises believe it is almost certain or likely that a pandemic will occur.

That number (35.3%) is just a bit over 20 times the number (1.7%) that has a tested plan covering the appropriate duration.

**Processes Used in Creating the Plan**

The next area we explored with the respondents was to understand the process they had used to create their plan, including the internal sponsorship and funding processes and status. The most common process used to create and implement the plan was the formation of a cross-functional team, task force or committee.

Here is a sampling of the wide variety of sponsorship responses:

--- CEO
--- Business Unit President
--- Facilities
--- HR
--- Corporate Task Force
--- Chief Administrative Officer
--- HS&E Department/Health and Safety Organization
--- Sales
--- Supply Chain Risk Management Department

While each of these sponsors have some value and credibility we believe that something as important as a pandemic preparedness plan MUST be sponsored and owned at the top.
SHOW US YOUR PLANS...

The next key area we wanted to study was the plan they had put into place. Here is a sampling of the range of responses that were received when we asked them to describe key elements of their plans:

--- Food and water isolation capabilities

--- Ability to transfer manufacturing capability from China to US/US to China

--- Raw material contingencies by building inventory of critical materials

--- Electronic transfer of critical work activities

--- Use of the CDC business pandemic planning checklist

--- IT connectivity to allow work from home (but did they consider the fact that everyone will be working from home and if they don’t have some type of special access contracts with ISPs, or private lines, their employees won’t be able to get through?)

--- Contingencies for key personnel

--- Sanitation and hygiene education

--- Identification of critical workload

--- Established communication structure & plan with roles & responsibilities

--- Plans for travel restrictions

While we did find this to be a good starting list, we found that the major shortcoming in the responses was a lack of completeness that could cause serious problems in a firm’s ability to continue operations under the ongoing emergency of a global flu pandemic.
... AND WE’LL SHOW YOU OURS

Our research team of Supply Chain and Epidemiology talent decided to put together a basic list of elements that we believe are essential in a pandemic preparedness plan. The elements cover customers and trading partners, employees, and some miscellaneous activities.

These elements will become the basis for determining enterprise readiness, and will be one of the indicators we will use in our methodology for calculating an organization’s PDI (Pandemic Demand Index)™ which will in turn be used to calculate an organization’s PRI (Pandemic Readiness Index)™ which will be covered later in this report.

We asked the respondents which of these elements their plans had taken into consideration. Then we asked them to designate their top 3 most critical elements to include or consider when creating and implementing a Pandemic Preparedness Plan.

The Customer and Partner Elements

The elements that we deemed critical to have in a plan relative to customer and trading partners were:

Trading Partner Readiness - A plan or approach for assessing the preparedness or vulnerability of your key suppliers/trading partners.

Supply Continuity - Steps to insure continuity of supply for critical items—materials and services—such as stockpiling critical materials; or IT infrastructure for working at home, secondary or alternate sources; special case contractual clauses with suppliers, etc.; need will be determined by Company PDI (Respondents: #2 Critical Element)

Demand Forecasting - Steps to predict the impact the pandemic will have on demand for your products or services (Company PDI)

Demand Readiness - Mechanism for detecting and responding to dramatic spikes in demand due to the phases of a pandemic – transfer / addition of manufacturing and distribution capacity
The Employee Elements

The elements that our team deemed critical to have in a plan relative to employees were:

- **Employee Prioritization** - Identifying which employees or job types will be critical, somewhat critical, or non-essential during the phases of a pandemic; will be driven by Company PDI, and will drive costs for PPE’s (Personal Protective Equipment) and training (Respondents: #1 Critical Element)

- **Employee Special Contracts** - Employee contracts or incentives to work during a pandemic

- **Staff Continuity Plan** - A staffing strategy in place that addresses the % of critical employees that are “no show” during a pandemic (Respondents: #3 Critical Element)

- **Cross-Training** – Cross-training of critical resources for essential job positions

- **Employee Protection** - PPE (Personal Protective Equipment) on hand for essential employees and their loved ones; care for employee families; medical supplies (antivirals, such as Tamiflu, and personal protective equipment, NIOSH N-95 masks, gloves, safety goggles, etc.)

- **Policy Enhancements** - Medical leave policy enhancements; enhanced travel policies – contingencies during restricted travel and quarantine.

Miscellaneous Elements

The miscellaneous elements that our team deemed critical are:

- **Operations Alternatives Plan** - The ability to reorganize virtual and/or on site workload

- **Communications Plan** - Involve your communications department in the messaging

- **Policy Flexibility Plans** - Travel policy enhancements to include possible quarantine after international flights

- **Risk Analysis** - Worst case scenarios/risk analysis relative to duration and length of the pandemic
WHICH ELEMENTS DOES YOUR PLAN CONTAIN?

To get a sense of how complete our respondents’ plans were, we compared their plans to our list of critical elements.

So, as you can see from the charts that support this section (figures 8, 9, and 10), of the 10% of enterprises that DO have or are in the process of putting a plan into place, 10% or less of those plans contain the elements that we have deemed as critical. These elements are key foundational information as we begin to explain and use the ChainLink methodology for assessing true readiness of an enterprise, or their PRI (Pandemic Readiness Index).
Mechanism and procedures for monitoring, detecting, responding to dramatic spikes in demand due to pandemic phases
Steps to anticipate, predict impact pandemic will have on product/service demand
A plan or approach for assessing the preparedness of other channel partners/customers
Steps to assure continuity of supply for critical items—materials/services
A plan or approach for assessing the vulnerability and preparedness of your suppliers and 3rd party service providers
Enhanced travel policies
Medical leave policy enhancements
Care for employees families
Protective equipment on hand for essential employees
Cross training of resources for essential job positions
A staffing strategy in place addressing % of critical employees “no show” during pandemic
Employee contract/incentives to work during pandemic
A plan or approach for stratifying or prioritizing employees

Figure 8—Which customer and trading partner elements does your pandemic preparedness plan contain?

Figure 9—Which employee and staffing elements does your pandemic plan contain?
MAJOR ROADBLOCKS TO PLANNING

Now that we have given you a baseline of data to paint a clearer picture of the situation, let’s look at some of the greatest hurdles to overcome in the creation and implementation of a pandemic preparedness plan.

- **Disbelief.** Disbelief of executives and employees that a pandemic will occur.
- **Lack of Tangible Threat.** Nothing to trigger plan development and funding.
- **Lack of Education.** Not a clue about what a HUGE negative impact a pandemic could have on their enterprise.
- **Procrastination.** The attitude that we can deal with this later.
- **Lack of Management Focus.** Tendency for senior executives to rightly focus on critical things like expanding market share, profitability, shareholder value, brand recognition, etc., but unfortunately resulting in almost no focus on managing this risk. It is definitely vital, but it is not yet urgent.
- **Lack of Ownership.** Belief that the government should or will come to the rescue; unclear on the role of business in a pandemic; internal disagreements on who should do the work.
- **Lack of Funding.** Inadequate or unavailable budget allocation to the plan/execution.

Figure 10—Which other elements does your pandemic preparedness plan contain?
LESSONS LEARNED

It is always interesting in a survey or interview to ask what were your lessons learned. This survey was no different, as the responses from those that have / or are trying to have a plan in place were pointed and heart felt. It goes without saying that the successful creation of a pandemic preparedness plan is tough going. Here are the survey responses on lessons learned.

- Get beyond the hype and prepare a realistic plan.
- Start planning early, get CEO buy-in and involve the HR and Law departments.
- Be honest about your limits during a possible Pandemic. Creating a flexible enough structure to deal with fluctuating inputs and changing employee family needs.
- Workplace hygiene is easier and potentially more effective than we thought.
- Cross-training has obvious additional benefits and should be done without causing feelings of job insecurity.
- Select an effective ombudsman to steer the process; meetings with individual business units separately and then collectively.

What did you learn???

"The biggest lessons are the need to be flexible at all levels from employees, suppliers and customers. Rigidity and inflexible systems will break down and freeze the production. Without flexible work environment taking into consideration changing labor and material inputs, everything will grind to a halt. Since X Company has had a very lenient and flexible employee policy given the physical nature of the work and the need for workers to deal with chaotic family lives, we found that this flexibility was easier for us to plan for---other more rigid companies may have a more difficult time."

(Quote from survey respondent)
ChainLink Assessment Methodology

Readiness could be viewed as “in the eyes of the beholder.” But the safest and least risky way to view readiness is through the lens of a solid methodology. That’s why our team spent time creating the Pandemic Preparedness Methodology and its supporting indices:

Pandemic Readiness Index (PRI) – A measure of the readiness of a business or industry to meet demand during the phases of the pandemic

Pandemic Demand Index (PDI) – A measure of the expected demand for specific products and services during phases of a pandemic

Calculating your Company Pandemic Readiness Index (PRI)

We expect that during the pandemic, most companies capacity to deliver goods and services will be diminished, for a variety of reasons. The definition of the Pandemic Readiness Index (PRI) is the ratio of a firm’s capacity during a Pandemic compared to the expected demand for that firm’s products and services during a Pandemic. Mathematically this could be expressed simply:

\[ PRI = \frac{Capacity}{Demand} \]

In other words, PRI is the percent of expected demand during the pandemic (PDI) that a company is prepared to fulfill. PRI of 100% means I am ready to fulfill all expected demand, PRI of 20% means I can only fulfill 1/5th of expected demand, etc.

So demand is critical here. If during a pandemic, my capacity goes to 1/10th of what it currently is, but demand also goes to 1/10th, then I’m ready – my PRI is 100%. On the other hand, if demand went up by 100X normal (which could be the case for certain items) then even if a company increased capacity to 10X normal, it is not ready - it’s PRI is only 10%.

Later below, we will discuss how to estimate expected demand during the pandemic.

Calculating Capacity

OK, so how do we calculate the expected capacity for a firm? A company’s capacity is a function of the “weakest link in the chain.” For example, if the supplier of a critical component used in all of a Company A’s products is unable to deliver anything during a pandemic, and there are no alternative sources, then no matter how well prepared Company A is inter-
nally and no matter how well prepared all its other suppliers and partners are, that company will have zero capacity during the pandemic (not counting any stockpiled inventory that they could continue to sell).

Calculating readiness therefore involves gauging the readiness (capacity) of all critical resources required to deliver a firm’s products and services during the pandemic. The three major categories of critical resources are internal resources, suppliers, and third party service providers. The process of assessing readiness in each of these areas is a major first step towards achieving readiness, as it involves uncovering the weak links, thereby identifying the areas that need to be addressed.

**Internal Resource Readiness:** This is primarily about having a well-thought-out staffing plan, protective equipment, training and education, communications plan, telecommuting options for employees, etc. to ensure that key employees continue to work and key functions continue to be performed. Realistically, there will be diminished employee capacity during the pandemic, but the extent can be estimated based on how well a company has prepared and practiced these key elements.

**Supplier Readiness:** This involves identifying key suppliers and evaluating each of their readiness plans. Ideally, you should contractually require each key supplier to provide you with their plan and their own self-assessed Pandemic Readiness Index, including the analysis behind the calculation. By auditing these, you can estimate what % of the parts, materials, and components you should expect to be delivered during the pandemic. In addition, this helps to identify weaknesses that need to be addressed through alternate sources, helping suppliers develop readiness, and contractually locking up a larger share of their capacity during a pandemic. As part of this process, you need to share your PDI and associated demand information with your key suppliers and other business partners as part of the synchronized pandemic preparedness activities with them.

**Third Party Readiness:** This is very similar to supplier readiness—you should identify key third party service and infrastructure providers and evaluate their readiness to continue to deliver them. This should include transportation, communications, electric power, service and repair, even things like your cleaning service (your employees will stop coming to work during a pandemic if the place is filthy). It also includes your distribution partners, resellers, and retail channel partners. Depending on the level of importance, you may ask for different levels of detail for evaluating their readiness.

Once each of these readiness elements is understood, you can estimate your capacity during the pandemic by identifying the constraints or weakest links. For example, if you will only have 25% of the transportation capacity (including all available alternatives) then regardless of how well prepared the rest of your suppliers and your enterprise is, your total capacity will be cut down to 25% of normal. Capacity may vary by product line or region as well.
As with demand, a firm’s capacity will likely change during the course of the pandemic. Thus a firm’s projected PRI ratio may also vary as the pandemic progresses.

**Pandemic Demand Index**

Expected demand is key to determining readiness. The Pandemic Demand Index (PDI) methodology helps estimate what the demand will be during a pandemic. PDI is the ratio of expected demand (during the Pandemic) compared to normal demand:

\[
PDI = \frac{\text{Demand During Pandemic}}{\text{Normal Demand}}
\]

For example, if the demand during the pandemic will be half of normal, then PDI = 0.5. A PDI of 1.0 means demand will remain the same as during normal times. PDI of 0.3 means demand will be 30% of normal. And PDI of 100 means demand will be 100 times the normal demand. Companies may use existing forecasting processes and systems to calculate more granular PDI, for example by product or geography.

**Expected Changes in Demand**

During the pandemic, there will be a significant overall economic downturn and contraction, but not all products will experience a decline in demand. In some cases demand will go up dramatically. Here are some examples of expected impact on demand:

**Down**

- Air travel - Passenger travel down severely, cargo down somewhat. It is possible time-shared private jet usage may go up (e.g. NetJet)
- Hospitality – Hotels and lodging, restaurants (especially KFC and other poultry-based chains), resorts and spas, cruises. People afraid to go out.
- Entertainment in public crowds – e.g. theaters, ball parks, concerts, museums, etc.
- Fuel consumption – major up-tick in demand at the beginning (hoarding), then down as people hunker down and stop traveling.
- Non-essentials such as fashion, jewelry, cosmetics, home furnishings
- Automobiles
- Real estate
Up

- Tamiflu, masks, gloves – personal protection equipment (PPE’s)
- Power generators, flashlights, etc.
- Ventilators, etc.
- Large screen TV’s – people want to get their entertainment safely at home.
- Grocery – non-perishables
- Bottled water
- Diapers, baby formula
- Internet usage – both personal and telecommuting.
- Guns, ammunition (yes, people will be scared and protecting what they have stockpiled or using aggression to get what they need but haven’t stockpiled)

For industries in the “up” group, lean inventory and reliance on JIT transportation is the wrong strategy leading up to the Pandemic. This may create the need to buck what Wall Street wants and expects by raising inventories … even dramatically as the Pandemic nears.

Neutral

- Trucking – some will go down and some will go up. Trucking companies should look at which industries they support, and may want to consider coveting and shifting capacity to industries with higher demand during a pandemic.
- Warehouse space – as with trucking, demand will shift from current levels. Companies in the “up” category may stockpile finished goods to prepare for the surge in demand. Goods in the down category may languish in warehouses, but production will also be down, slowing inflows into warehouses and distribution centers.
CALCULATING PANDEMIC DEMAND INDEX (PDI)

Understanding PDI, even for a company that supplies materials or components in the middle of a supply chain, starts with understanding demand at the ultimate end customer for the product or service that the supply chain delivers. Ultimately, this comes down to understanding the changes in behavior at the end customer.

Changes in Consumer Consumption During a Pandemic

If the end customers are individual consumers (as opposed to businesses), expected changes in behaviors might include:

- People will hunker down. They will stay at home.
- People (and companies) will stockpile certain items.
- People (and companies) will postpone non-essential purchases – major and minor.
- People will hoard cash at home (afraid to go to banks).

A company then needs to estimate how these will impact demand. Demand during past epidemics, such as SARS, can help reflect the direction, but not necessarily the magnitude of change.

Companies that are part of the supply chain selling to consumers, thus need to understand what will happen at the end of their supply chain. For example, a supplier of the raw materials used by manufacturers of the specialized fabrics that go into protective masks should expect a huge surge in demand at least for those specific materials. In fact, that surge will happen early in the evolution of the pandemic, if the mask manufacturers are planning properly.

Changes In Business Consumption During a Pandemic

In general, capital expenditures and discretionary spending will shrink dramatically. But again, it depends on the industry and product. Some businesses in the high-demand or “up” sectors may be scrambling to increase manufacturing capacity, and therefore placing rush orders for more equipment.

Companies deep inside a supply chain must analyze what will happen in the end customer markets – not just their immediate customer. In many cases, their end markets may be very horizontal. For example, a manufacturer of plastic pellets may find their products end up in consumer goods, high tech hardware, packaging, automotive, office equipment, aerospace, toys, industrial goods, etc. If you sell across a broad cross section of industries, in general the demand for your products will likely shrink as the economy contracts. However,
some analysis of the mix of end markets and expected demand for each product is still prudent in calculating overall demand. For example, a plastic pellet manufacturer might realize that half their product is going into making bottles used for bottled water. They may then expect a big increase in demand.

For a better idea of how things change during disasters, look at your actual consumption data from other disasters. This will give you some idea of what types of goods and services were on the increase and what types were decreasing.

**INDUSTRY PDI VS. COMPANY PDI**

There is one more twist in understanding your expected demand or PDI. So far we have been discussing what happens to the demand for a specific product or service across the entire industry that supplies that product. But the PDI for an individual company may actually be significantly higher than the Industry PDI. This is because not all companies are equally prepared. So, if the capacity of the industry shrinks dramatically, then the demand available to the few companies still standing during the pandemic will increase dramatically. In other words, the handful of companies that are prepared and still operating will have to fulfill the demand for the entire industry.

So, in order to understand a company’s PDI (as opposed to the Industry PDI), you must know what will happen to the overall capacity of the industry as a whole (i.e. all your competitors, plus you). If demand stays the same, but the industry readiness goes way down, then people will be desperate for a source for that product. In that case, an individual company that can deliver will see demand go through the roof, even though overall demand across the industry might be staying the same or even going down.

Therefore it is the individual company PDI that must be used as the “demand” part of the formula in calculating the company’s PRI (remember PRI = capacity/demand). If the rest of the industry can’t produce during the pandemic, you can only claim to be 100% ready if you will have the capacity to fulfill all available demand.
Microbix—Employee Preparedness Example

Here is an example of one company that has done a good job in two critical aspects of employee preparedness – PPE and education.

Microbix Biosystems Inc. is located in Toronto, Canada.

Microbix was established over 20 years ago as a virology company. They work with infectious agents such as influenza virus as part of their day-to-day business. Microbix has prepared a response plan to help protect its employees and their families in the event of a flu pandemic. Being located in Toronto, Canada, Microbix saw firsthand the havoc SARS played on the people and businesses in their area, and the devastation to both people and the economy. They have become very proactive to protect their employees and their business.

Microbix has used its expertise in virology to select a number of tools for use by its own employees. The company has now made these tools available in a convenient package for the general public in the Microbix Pandemic Response ToolKit. This ToolKit also comes with a manual that will give you information on how you can use the items in the ToolKit along with some common sense precautions and preparations to help reduce the impact of an outbreak of pandemic flu on you and your family. The ToolKit already made available to their employees also contains some PPE’s, and reordering information on how to obtain more for their homes and families.

Recently we talked to their General Manager and learned they have further added information on how to care for family victims sick with pandemic flu at home, as this will very likely be the case in any worst case scenario. The healthcare system will be so overwhelmed; it will be among the first industries to succumb to a pandemic as a very small percentage of people looking for medical attention will actually be seen by any healthcare worker. They have enlisted the help of an Emergency Room Doctor who was on the front lines during the SARS incident in Toronto, Canada, to write a protocol on setting up an isolation area for caring for the sick at home, and how to properly use PPE’s while caring for a sick family member.

For additional details you can also read or download the complete Microbix Pandemic Response Plan at www.microbix.com
Critical Success Factors

This could be called the "no kidding, Sherlock" section. But, we felt that it was important to include it — albeit somewhat stating the obvious. The decision to include it was made upon careful review of the survey responses regarding lessons learned and the deductions that we made as a result of that review. And, although they may be obvious, they are NOT being executed by the majority of the enterprises out there. Read on; see what a difference it can make for you as you set out to achieve your desired position on the pandemic preparedness spectrum.

Ownership and Sponsorship of the Plan

As we have learned over the years in a variety of project types — Enterprise IT, Business Process Improvement, etc. — it is always important to have sponsorship or ownership at the senior-most levels of the organization. This is for a couple of reasons. One, it acts as a constant reminder to those working on the initiative and those on the receiving end of the initiative of the importance of the initiative. The analogy of using the CEO as the "breath of wind" to get the kite off the ground comes to mind here. Second, it acts as an "asset lubricant" to get supporting resources and funds for the initiative allocated with the appropriate priority and in a timely fashion. Pandemic Preparedness Initiatives are no different. As a matter of fact they probably require a higher more focused sponsorship that most other initiatives, because many people believe that this type of disaster is not going to occur, and so other programs, initiatives, activities should take a much higher priority. We believe that this initiative MUST be one that is on the CEO’s radar and priority list. End of discussion.

Well, almost the end of the discussion….just one additional point. CEO’s may need some prodding by an effective spokesperson/cheerleader. If you are or want to be that person in your enterprise, then we suggest utilizing this report and our webinar slideware to aid you in doing so.

Education for Partners and Employees

At the heart of any good enterprise initiative is a solid education strategy. Pandemic Preparedness initiatives are no different. One, the medical aspects, associated impacts, and risks are further from the typical employee’s skill/knowledge realms. And second, the other "p word" —Pandemonium—is highly likely to occur as we move through the phases of a pandemic disaster. Education can minimize the risk of pandemonium as these events unfold. By educating your employees about what care is and will be available for them and their loved ones, you will take a huge step in minimizing the risk of employee "no show" or "walk away" when things start to heat up during a pandemic.
Think of this scenario: two manufacturing assembly line workers, employed by two hypothetical firms. Sally works for ReadiCorp. ReadiCorp has a well-thought-out, adequately funded pandemic preparedness plan that has support from the top down. Sally received a message from the CEO describing what steps have been taken to minimize the risk of illness during a pandemic. She has been given personal protective equipment for herself and her family. In addition, anti-viral drugs have been made available. As a pandemic nears, Sally and her co-workers are given an educational session on what avian flu is, how it spreads, how to protect against it, and what will keep them safe. A hot-line has been setup to answer questions. And as the pandemic progresses, each plant has regular open forums to discuss employee concerns and questions.

Let’s contrast that with Dave, another assembly line worker who is employed by ProcrastiNada Inc. which has a business continuity plan developed 10 years ago that has since been collecting dust on the shelf, with no Pandemic Preparedness section in the plan. The management of ProcrastiNada has never even discussed the topic of the pandemic with their employees, let alone procured PPE. Once the pandemic starts, they are scrambling and competing with thousands of other companies and individuals for now incredibly scarce PPE and other resources.

As the pandemic unfolds, Sally is understandably apprehensive, but because she knows what causes transmission of the disease and has the protection that has been given to her, she is willing to come in to work. In contrast, Dave sees a co-worker coughing and hacking, and even though it’s only a cold, feels his life is genuinely in danger. Rumors abound about disease and death. Dave and most of his co-workers decide, “Better to get fired than die” and stay at home throughout the pandemic, in spite of the financial hardship.

Partner education: a new frontier for the federated enterprise, and a massive requirement in this realm. As we discussed in the area of PDI and PRI, partners play a make or break role in minimizing business disruptions. Minimization of pandemonium inside your four walls is only part of the equation.

The last two critical success factors must be included in the education plan. These are central to making your employees and their loved ones feel prepared.
PERSONAL PROTECTIVE EQUIPMENT (PPE)

A key success factor for a Pandemic Flu Preparedness Plan, in addition to the business/supply chain side of a plan, must be a concise and very specific plan for PPE’s and “good flu hygiene,” which includes education, fit testing (we’ll get to that later), and testing the plan. Having these items on hand and an employee’s education completed goes a long way in alleviating the fear that many employees may have in coming in to work. Preposition needed supplies NOW.

We must also emphasize that reaching back to those employees’ families and making sure that employees have prepared at home is critical. Knowing that your family is safe and that preplanning for supplies at home has taken place relieves the anxiety, and allows for greater productivity at work. In this regard, ChainLink has a separate document entitled “Pandemic Flu—Family Supply List.”

In order to make these plans effective, you must stock up beforehand on the medical supplies (antivirals, such as Tamiflu, and personal protective equipment, such as NIOSH N-95 masks, gloves, safety goggles, etc.) in the quantities needed. If you think these supplies can be purchased with the “just in time delivery” thinking you will be sadly mistaken. The importance of Personal Protective Equipment (PPE’s) must not be taken lightly. For example, most of our single-use latex or nitrile exam gloves are made in Asia, as are other PPE’s, so the lead time is long. These items will be the first to fly off the shelves when the first real PANIC BELL rings. Therefore, without a stockpile already on hand, PPE’s will be impossible to obtain, because effective PPE’s will be gone in a matter of days. We believe that not having these items will be the single most important factor that will keep employees from showing up to work.

A full description of Antivirals, Particulate Respirator Masks, Eye Protection, Face Shields, etc., can be found in Appendix A.

WELL-DEFINED MILESTONES

A complete plan includes well-defined milestones (e.g. WHO alert level changes) that trigger further preparedness investments (such as stocking protective equipment). See sample synchronized preparedness chart on page 36.

TESTING OF THE PLAN

We strongly believe, and our survey results substantiate, that in the Pandemic Preparedness arena, testing is one of the most overlooked components of a complete plan. In addition, testing should occur regularly. We recommend every 6 months or less. The primary
reasons are to insure that as a pandemic draws nearer and nearer the assumptions in the plan are validated, and that the implementation team is focused toward continuous improvement with each iterative test. The communications, medical triage, IT infrastructure (for employee telecommuting) and reaction areas of a plan are several of the most critical to test. It is also important to practice the stratification and cross training of employees on the critical workloads. As we have mentioned numerous times in this report, this testing activity, just as the creation and implementation mentioned above, should be synchronized with your trading partners.
Emerging Best Practices

**USE OF THE CHAINLINK METHODOLOGY TO ASSESS PDI AND PRI**

Creating and implementing a Pandemic Preparedness Plan without an understanding of your enterprise’s needs (i.e. demand, and your true level of preparedness) is a very costly and risky venture. But, the use of the Chainlink Preparedness Methodology and it’s supporting indices will assist in the creation and implementation of the plan that is the RIGHT one for your enterprise. Enough said, let’s move on.

**CROSS-SECTOR RESOURCE LEVELING FOR STAFF AUGMENTATION**

Your plan for preparedness MUST call for the right staffing levels to support your enterprise’s PDI, and that correct level of staffing may be greater than you are able to provide within your four walls and with the synchronized help of your partners. If so, an emerging best practice is to select an industry sector or subsector that has a lower PDI than you but has complementary or supporting skill sets and set up a contractual agreement with them (PRE pandemic) to use some of their resources to augment your staff. Here is an example: a grocery store chain may wish to forge a partnership with a fast food/restaurant chain since the fast food/restaurant business will drop off significantly during the phases of a pandemic but the grocery industry will remain high and even higher than normal. It goes without saying that your PPE and other associated education/training/contractual elements of your plan must include those augmented resources.

**CREATION AND DEPLOYMENT OF AN EMPLOYEE PREPAREDNESS PROGRAM**

As you read in our Microbix example, the creation and use of an employee ToolKit or preparedness program is a very good idea. Not just a good idea, but one that has been put into practice with glowing results. It provides a simplified set of information and aids (such as medicine, steps to take in a disaster, what to expect as far as care during the pandemic, etc.) to be put into an easily to accessible and understandable format for all employees and their loved ones. This is especially important in the execution of the hygiene program. It also acts as a reinforcement of the education they should have already received.
SYNCHRONIZATION WITH PARTNERS AND WHO PHASE OF PANDEMIC ALERT

It is easier to become complacent when the focus of operations is totally within your own four walls. With an inward focus, you can get a sense that all is well and you are able to withstand the impending pandemic, when the truth may be that the trading partners you rely on are not ready at all. To that end, this emerging best practice is to put integrated preparedness plan elements in place with each of your trading partners (your federated enterprise) as well as to tie trigger points in your implementation plan to the WHO Phases of Pandemic Alert rating scale. These trigger points are primarily associated with resource allocation — the procurement of PPE’s, inventory stockpiling of critical materials, and execution of additional contract clauses with trading partners and employees. This is important, as you learned in the Medical Facts section of this report, because the pandemic will make its way around our globe in a matter of days to several weeks. These synchronization points and assuring your partner’s preparedness must be done as part of your ongoing partner performance measurement, and should even be included in contractual terms/conditions. If the sync points are not included in the contract, including procedures for auditing compliance and penalties for non-compliance, then there will be no compliance (or not nearly enough).

Here is a somewhat simple example, but should set the stage of understanding. Assume that you are a bottler of spring water. For each stage of the WHO pandemic level, you create a series of activities based on expected demand (PDI), what steps you should take as the bottler (such as stockpiling, employee education, PPE’s, etc.), what steps your bottle manufacturer must take, what steps your 3PL must take, and what steps your distributors must take. Utilize this “grid” as the overall pictorial framework and representation for your detailed plan. Thus, precisely defined trigger points will cause elements of the plan to be executed and specific financial commitments to kick in, such as exercising capacity options or taking ownership of additional stocks. There may be negotiations on sharing some of this burden, such as the ownership of the portion of inventory above and beyond what is normal.

<table>
<thead>
<tr>
<th>Key Steps in Trading Partner Synchronization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let your PDI and PRI drive the prioritization of partners needed during a pandemic</td>
</tr>
<tr>
<td>Require them to go through an audited readiness assessment and participate in testing of the plan</td>
</tr>
<tr>
<td>Put key performance elements and supply guarantees in the contract with appropriate $$ “teeth”</td>
</tr>
</tbody>
</table>

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### Simplified Example of Trigger Points in Trading Partners

<table>
<thead>
<tr>
<th>Trigger Point</th>
<th>Expected Demand</th>
<th>Actions taken by all players</th>
<th>Bottler</th>
<th>Bottle mfg</th>
<th>3PL</th>
<th>Distributor</th>
</tr>
</thead>
</table>
| WHO Level 3         | 1.0 X Normal    | • Stockpile 50% of needed PPE  
• Train all managers  
• CEO announcement of readiness plan  
• Cross training of employees  
• Practice of telecommuting and other aspects of plans  
• Communicate expected Demand (PDI) and Readiness (PRI) to all key suppliers/partners | • Assess supplier, partner readiness  
• Establish contracts with key suppliers to lock in readiness  
• Establish contract with distributor to have them carry extra safety stock | • Procure long lead time items for future 2X normal production | • Assess carriers’ readiness  
• Establish contracts with carriers to lock in capacity  
• Establish contracts with warehouse providers | • Establish contracts with warehouse providers for extra capacity during a pandemic (use warehouses from industries where demand will be down during the pandemic) |
| WHO Level 4         | 1.2 X Normal    | • Stockpile 100% of needed PPE  
• Train all employees  
• Hire temps as needed  
• Communicate updated PDI and PRI to… partners | • Audit supplier readiness  
• Increase to 1.5X normal production | • Procure long lead time items for 4X normal production  
• Start Manufacturing 2X normal production | • Audit carrier readiness  
• Allocate warehouse space | • Stockpile 1.5X normal amount, taking title of 20% above normal |
| WHO Level 5         | 1.5X Normal     | • Distribute PPE to employees  
• Hire more temps as needed  
• Communicate updated PDI and PRI… | • 2X production | • 4X production | • Exercise warehouse options | • Stockpile 3X normal amount, taking title of 1.5X normal amount |
| WHO Level 6         | 3X Normal       | • Activate limited telecommuting plan  
• Distribute antivirals  
• Communicate updated PDI and PRI… | • 4X production | • 4 X production | • Exercise transportation capacity options | • Stockpile 6X normal amount, taking title of 3X normal amount |
| North America reaches 1% infection level | 20 X Normal     | • Activate full telecommuting plan  
• Communicate updated PDI and PRI… | 2X normal production | 2X normal production | Manage extra capacity | Draw down stockpile over 12 months |
| Pandemic Peaks      | 2X Normal       | • Scale back temp employees as needed  
• Communicate updated PDI and PRI… | • Normal production  
• Scale back temps | • Normal production | Manage extra capacity | Draw down stockpile |
| NA infection level recedes to 1% | 1X Normal       | • Scale back temp employees  
• Communicate updated PDI and PRI… | • Normal production | • Normal production | Scale back to normal capacity | Draw down stockpile |
Conclusion

It’s hard to wrap up this report because so much is occurring daily that could be included, but we have to stop somewhere! The research has been an emotional and heartfelt effort by our team – perhaps a bit different from any other research we have ever embarked on. Quite simply, because it is a matter of life and death, and we do feel that it is one of our Corporate Social Responsibilities to assist enterprises to be successful in their effort to plot their course on the “spectrum of preparedness.” Here are the conclusions that are a result of our extensive passion and research. And, after careful reading of this report, none of them should be a surprise to you.

It isn’t a matter of “IF,” it’s a matter of “WHEN.” If you aren’t sure about this, take some time to turn back to the Medical Facts section of this report (page 4) and turn on CNN every night. How else can we say it? The stars are aligning? The ducks are in a row? (now, there’s a good one!) It may be easy to procrastinate, put your corporate head in the sand – be on the ostrich end of our preparedness spectrum, and spend resources on sales and manufacturing for now.

But our next conclusion is a simple one. To quote the age old Midas commercial (with a bit of a twist): The cost of unpreparedness is far greater than the cost of preparedness. This is especially true when you take into consideration our comments around the trigger points for controlling actual investment, and synchronization with your partners, in elements of the plan – such as PPE’s. This is precisely why we also conclude that the use of the ChainLink methodology and its supporting indices will minimize your overall cost and risk.

If you have a good plan, then it will call for solid education and communication to your population, as well as to those good folks in your trading partner’s organization that you rely on to get your supply chain business done. It has always been a common bad practice to short side the education funds and communication effort in a plan. It seems that enterprises believe that is too “soft” or “touchy feely,” and they can’t bring themselves to find the ROI in those efforts. Only one little word of reminder here – Pandemonium. Use your dollars wisely to prevent it – go right to the source – your employees and your partner’s employees.
This is the last time that we will mention testing of the plan. It may be the dead horse in the corner. So, just step over it and get on with creating, implementing, and testing your plan.

Let's close this report out with a comment and conclusion about the Government. It is actually one that the Government has already said themselves: DON'T EXPECT THE GOVERNMENT TO COME TO YOUR RESCUE. You are a responsible party in your enterprise – the responsibility to plan for you and your employees is on you. Utilize us, our team, our knowledge, our passion, and most importantly, our offering to come to your rescue.

Warm regards,

The ChainLink Team
Appendix A  - Advanced Infection Control

WHAT ARE THE SYMPTOMS OF THE FLU?

Pretty much what we are already familiar with…sore throat, cold, fever, chills, aching, nausea and vomiting. Those people who have caught the H5N1 flu have had additional problems such as: the “cytokine storm” symptoms we mentioned earlier; many have had intestinal symptoms showing up first; and some have had neurological involvement. In the recent Family cluster case in Indonesia which involved eight family members, seven died, the remaining 25 year old male has brain involvement.

WHAT IS THE INCUBATION PERIOD FOR CATCHING THE FLU?

The time between human exposure and onset of illness (incubation period) is usually 2 to 4 days.

HOW LONG DOES A FLU PANDEMIC LAST?

Generally flu pandemics come in three waves, with the second wave usually being the worst. A global pandemic usually takes up to eighteen months for the three waves to have made their rounds and begun to subside.

HOW CONTAGIOUS IS THE FLU?

The influenza virus can live on an inanimate surface for up to 48 hours, it can live on your clothes for up to 8 hours.

HOW IS THE FLU SPREAD?

The flu can be spread by droplet infection (coughing, sneezing, bodily fluids), it can be spread by direct/indirect contact….shaking hands, touching door knobs, computer keyboards, shopping carts, etc. The flu can also be airborne, and many influenza experts are calling for “social distancing” during a pandemic while out in public or at work (3 - 6 feet), and if you are in public during a pandemic you should be wearing your PPEs.

WHAT CAN I HAVE MY EMPLOYEES AND THEIR FAMILIES DO NOW TO HELP PREPARE BESIDES PPE’S AND FOOD STOCKPILING?

Make sure your employees and their families are up to date on their vaccines such as the annual flu vaccine, Tetanus, and the Pneumovax vaccine (this protects against secondary bacterial pneumonia). Also a Hepatitis A vaccine is not a bad idea if our utilities are not al-
ways working and we are forced to drink or eat questionable water or food. Be sure to contact your own Physician and discuss these matters.

The **SINGLE** most important thing we can do during a flu pandemic while at work, home or out in public is practice good hand washing skills. This means using plenty of soap with warm to hot water and scrubbing 30–40 seconds. Remember to get the back of your hands and in between your fingers, under your nails and up your arms. Rinse thoroughly and dry with a paper towel and then turn off the water with the paper towel, so as not to contaminate your hands on the dirty handle. Using an alcohol based hand sanitizer is also recommended (not a antibacterial soap that is not alcohol based). To use this, thoroughly wet your hands with the sanitizer and let air dry, do not towel dry. If you are sneezing or coughing be sure to use Kleenex, and properly dispose of them. If Kleenex is not available, sneeze into the fabric of your shirt sleeve…don’t have that 200 mile an hour sneeze going into the face of the person in front of you! Frequently clean work surfaces at work and at home with either viral germicidal wipes or a weakened bleach solution (one part bleach to 4 parts water), don’t forget your telephones and computers!

**Okay… Now let’s get specific about medical personal protective equipment.** When we talk about PPE’s we also want to include antivirals in this section. Antivirals have proven to be effective for some people during a normal flu season, in most cases they may not prevent you from getting the flu but they can lessen the severity and the duration considerably. Some companies like Roche Laboratories, makers of TAMIFLU, have done testing with Tamiflu and H5N1 and this drug shows promise.” The World Health Organization suggests clinicians use oseltamivir (Tamiflu) as first-line treatment for H5N1 avian influenza, but they should consider giving one of the older antiviral drugs along with it in some circumstances.” (May 22, 2006 CIDRAP News). The WHO suggests dual therapy antivirals to be considered, besides Tamiflu, another neuraminidase inhibitor mentioned was zanamivir (Relenza), and the M2 inhibitors amantadine and rimantadine. Many companies (and governments) currently have contracted with Roche Laboratories, to obtain Tamiflu as part of their continuity planning and this should be considered in making your preparedness plan. Consult with your Company Doctor to obtain Tamiflu and how this should be prescribed.

**The next several items make up the meat of your PPEs:**

Particulate Respirator Masks – these should be fit tested (companies may try their local hospital and contact infection control to see if you can work this out, or send an employee from HR to be trained in fit testing), these masks must be NIOSH approved N-95 rating or higher. A surgical mask is a second alternative if respirators are unavailable, however, the mask should have a bacterial filtration efficiency (BFE) greater than 97%. Surgical masks are not as protective as respirators. Kimberly-Clark and 3M both make very good NIOSH N-95 masks. Generally speaking, you can buy a box of N-95s from Kimberly-Clark (35 to a box, 6
boxes to a case) for about + or - $34.00 per box. One mask can usually be worn for approximately 8 hours if it has not been soiled, contaminated, or become too moist.

Latex, Nitrile, or vinyl (if you have a latex allergy) single use exam gloves. These come 100/box and cost about $5.00/box. These are one time use and should be disposed of properly after usage.

Eye Protection (because there is evidence this is airborne, remember about the 200 mile an hour sneezes), wear goggles or a face shield. Goggles should have the side view protectors. Also, you can get these from medical supply houses, fairly inexpensively.

Alcohol based hand sanitizers, as talked about previously; use often!

Gowns – a long-sleeved cuffed non-sterile disposable gown may be needed for direct care for an infected person. This item will probably not be needed for most businesses.

Removal of contaminated apparel. Remove carefully to reduce the risk of self-contamination by remembering that the virus is alive on the surface of your PPE. Recommendations from the CDC and WHO follow:

<table>
<thead>
<tr>
<th>CDC Removal sequence</th>
<th>WHO Removal sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Gown</td>
</tr>
<tr>
<td>Face shield or goggles</td>
<td>Gloves</td>
</tr>
<tr>
<td>Gown</td>
<td>Alcohol-based hand rub or wash hands</td>
</tr>
<tr>
<td>Remove respirator after leaving room</td>
<td>Remove cap and face shield</td>
</tr>
<tr>
<td>(do not touch front)</td>
<td></td>
</tr>
<tr>
<td>Alcohol-based hand rub or wash hands</td>
<td>Remove respirator (do not touch front)</td>
</tr>
<tr>
<td>Also wash or alcohol rub any time</td>
<td>Alcohol-based hand rub or wash hands</td>
</tr>
<tr>
<td>hands become visibly contaminated</td>
<td></td>
</tr>
<tr>
<td>Leave room</td>
<td></td>
</tr>
<tr>
<td>Alcohol-based hand rub or wash hands</td>
<td></td>
</tr>
</tbody>
</table>

All of the above mentioned PPE’s can be found at most surgical/hospital supply stores. To find a distributor in your area call Kimberly-Clark, 3M, Johnson & Johnson or another medical equipment company. All have 1-800 numbers and they can point you in the right direction.
The Pandemic Survey results showed woefully little preparation with disaster planning in general, and no thought to what medical supplies and personal protective equipment will be needed now in order for companies to continue daily operations. Unlike natural disasters, hurricanes, tornadoes, flooding, etc., where people react with all out help regarding donations and volunteerism to an affected area, this may not be the case when we are faced with not just one small area in the world that is having a catastrophe, but something such as a virulent flu with a mortality rate of close to 60% happening globally; are your employees going to show up for work when there is no effective preparedness plan in place to protect them and their families?

Links for more info on Avian Flu:

[www.cdc.gov](http://www.cdc.gov) Centers for Disease Control
[www.who.int/en/](http://www.who.int/en/) World Health Organization
[www.cidrap.umn.edu/](http://www.cidrap.umn.edu/) (excellent site for up to date info) Center for Infectious Disease Research & Policy
[www.hhs.gov](http://www.hhs.gov/) U.S Department of Health & Human Services
[www.fluwikie.com](http://www.fluwikie.com) Public run site with lots of general information/planning info and Discussion forum