INTERNATIONAL FOODSERVICE DISTRIBUTORS ASSOCIATION

PLANNING FOR A HUMAN FLU PANDEMIC: EMERGENCY RESPONSE GUIDELINES FOR FOODSERVICE DISTRIBUTORS

Presented by
The IFDA Food Safety and Security Committee

Prepared by
Caroline Perkins
Principal, The Foodservice Content Company
and IFDA Staff

IFDA international foodservice distributors association

THE IFDA FOUNDATION FOR *Education & Research*

THE IFDA FOUNDATION FOR
Education & Research

The IFDA Foundation recognizes the following companies for their support of this important work:

Leadership Circle

International Foodservice Distributors Association
Kraft Foodservice
Unilever United States Foundation, Inc.

Chairman's Circle

Instill Corporation
F.A.B., Inc. (Frosty Acres Brands)
Heinz North America Foodservice
Land O' Lakes, Inc.
Unilever Foodsolutions

President's Circle

Doerle Food Services, Inc.
Integrated Distribution Solutions, LLC
Kellogg's Food Away From Home
Silliker, Inc.
UniPro Foodservice, Inc.

Executive's Circle

Ben E. Keith Foods
Ecolab, Inc.
SYSCO Corporation

Patron

J. Kings Foodservice Professionals
McCain Foods USA
Performance Food Group Company
SAP America, Inc.

Friend

ConAgra Foodservice
Hawkeye Foodservice Distribution
Kies Consulting, LLC
Par-Way Tryson Company
Sugar Foods Corporation

Published by
International Foodservice Distributors Association
201 Park Washington Court
Falls Church, VA 20046
(703) 532-9400
Website: www.ifdaonline.org

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report is presented by the International Foodservice Distributor Association (IFDA) Food Safety and Security Committee to help foodservice distributors understand and prepare for the impact of an H5N1 influenza pandemic on their business. This document was created to provide a discussion guide for each company's pandemic preparedness planning. It is believed that careful planning can lessen the impact of a pandemic on business.

It is important to consider that these guidelines, while focused on a pandemic, could be applicable to any crisis situation, from weather-related emergencies to terrorist events.

Nonetheless, this document is crafted to help foodservice distributors plan for the catastrophic effect of a human influenza pandemic. A worldwide pandemic presents challenges unique to any other potential catastrophe with significant loss of life and social disruption. It would be a global rather than a local event and would be of long duration—more than one year.

The background and recommendations included here were prepared using government data and other published sources, as well as brainstorming discussions conducted with a number of foodservice distribution executives. The discussion participants are listed in the Acknowledgements section of the Executive Summary.

The report is divided into three sections. The "Overview" describes how a pandemic could occur, why preparedness is critical, and posits reactions that might arise in the community, actions that might be taken by the government, disruptions that could affect the infrastructure, and the potential impact on distribution companies and their customers.

"Planning for a Pandemic," the second section, provides guidelines for a company to use as a basis to create its own preparedness plan. It covers the range of areas that would need to be addressed internally and externally. These are broken into Task Forces with "Centers of Activity" that describe a wide range of actions—from the founding of an emergency response team to cross-training employees for coverage of critical functions that could be in jeopardy from absenteeism due to illness or death.

A third section includes appendices. Three of these appendices contain information from the Center for Infectious Disease Research and Policy (CIDRAP) at the University of Minnesota. These include a "Historical Perspective" on influenza pandemics, the "Current H5N1 Threat / Vaccine Development," and "Current Pandemic Planning." Appendix D supplies a list of additional web accessible resources for information and forms that can be used in creating a preparedness plan.

The guidelines provide distributors with a process to facilitate their own company planning and will help distributors create a team and define the specific foodservice issues that must be covered in each area.

Acknowledgements

COVER PHOTO: Courtesy of the National Museum of Health and Medicine, Armed Forces Institute of Pathology, Washington, D.C. (NCP1603)

IFDA would like to thank the participants in four discussion groups who, through creative brainstorming, helped craft the "Action" points found in this report. The participants were: Tony Canty, Labatt Food Service; Diane Chandler, Martin Brothers Distributing Co., Inc.; Paula Cook, UniPro Foodservice, Inc.; Sinead Corcoran, J. Kings Foodservice Professionals; Annette Douet, Doerle Food Services, Inc.; Aaron Garman, Feesers Inc.; Richard Hairston, Ben E. Keith Foods; Jim Hartsell, Performance Food Group; Jorge Hernandez, U.S. Foodservice; Doug Karns, Martin Brothers Distributing Co., Inc.; Sharon Karlman, Reinhart Companies, Inc.; Jeff Kelly and team, Harker's Distribution Inc.; J.L. Nichols, Nichols Foodservice, Inc.; Kay Taylor, Progressive Group Alliance; Richard Walther, FoodPRO; and Craig Watson, Sysco Corporation. We also wish to acknowledge Tommy Hart of Alex Lee / Institution Food House for presenting the Alex Lee Pandemic Plan to the IFDA Food Safety and Security Committee meeting at which this planning work began.

We also recognize the significant contribution of Alex Lee, Inc., for their August 2005 work titled *An Analysis of the Potential Impact of the H5N1 Avian Flu Virus — Wholesale and Retail Grocery and Foodservice Industry*. That report was developed by a regional foodservice distribution, grocery wholesale, and retail food company in an attempt to understand the ramifications of a human flu pandemic. A task force of 15 professionals representing all key functional areas was formed with the assignment of brainstorming this issue and documenting as many ideas, recommendations, and suggestions as possible. They have shared that initial document to the industry without restriction. Alex Lee was assisted in this effort by Michael Osterholm, Ph.D., director of the Center for Infectious Disease Research and Policy (CIDRAP), University of Minnesota.

APPENDICES A, B, C: Our thanks to the Center for Infectious Disease Research and Policy (CIDRAP), University of Minnesota, for excerpted background information contained in these appendices.

Disclaimer

The Food Safety and Security Committee of the International Foodservice Distributors Association (IFDA) presents this report to aid foodservice distributors in preparing for a possible human influenza pandemic. The information in the report is current as of the publication date, but additional information may be available in the future. The details found in this report may not cover every situation and may not be applicable to all distribution companies. Actual responses to civil emergencies may be beyond the scope of these guidelines because of different factual settings, government responses, and the general uncertainty that may accompany any civil emergency. IFDA therefore cannot be held responsibility for any acts or omissions resulting from reliance, in whole or in part, on this document.

In the event of a large-scale outbreak of any infectious disease, federal, state, and local authorities will have broad powers to contain and prevent the spread of disease. These government responses may include measures that may make normal business operations impossible. IFDA has no control over such government measures and cannot be held responsible for those government actions.

OVERVIEW

WHAT IS A PANDEMIC?

An influenza pandemic is different from the seasonal flu that affects thousands of people each year. It is not to be confused with the common flu. Nor is it the avian flu that affects the bird population. The government defines seasonal flu, avian flu and pandemic flu as follows:

> **Seasonal (or common) flu** is a respiratory illness that can be transmitted person to person. Most people have some immunity and a vaccine is available. [The seasonal flu is a mutated descendant of the last human pandemic or epidemic and has significantly lessened virulence due to the population's partial immunity.]
>
> **Avian (or bird) flu** is caused by influenza viruses that occur naturally among wild birds. The H5N1 variant is deadly to domestic fowl and can be transmitted from birds to humans through close contact with fowl. There is no human immunity and no vaccine is available.
>
> **Pandemic flu** is virulent human flu that causes a global outbreak, or pandemic, of serious illness. Because there is little natural immunity, the disease can spread easily from person to person. [A human flu pandemic occurs when a virulent influenza virus from another species mutates to a form transmissible from human to human.] Currently there is no pandemic flu.[1]

In other words, the avian flu that has been spreading worldwide is not a human pandemic. The avian flu is a virus that is passed from one animal to another, in this case, birds. In some cases, humans have caught the avian flu from close contact with infected birds.

To date, avian flu has been identified in 50 countries. Humans in nine countries have contracted the disease from being in close contact with infected birds. As of October 2006, there have been 256 individual cases and 151 have died.

The flu is passed from one human to another human through sneezing or coughing. Droplets containing the virus are spread. In addition, the flu may be contracted by touching an infected person or surface and then touching one's face. The virus has a limited life span of a few hours when on a surface.

[1] PandemicFlu.gov Bracketed items are additions to these government definitions.

HAVE PANDEMICS OCCURRED BEFORE?

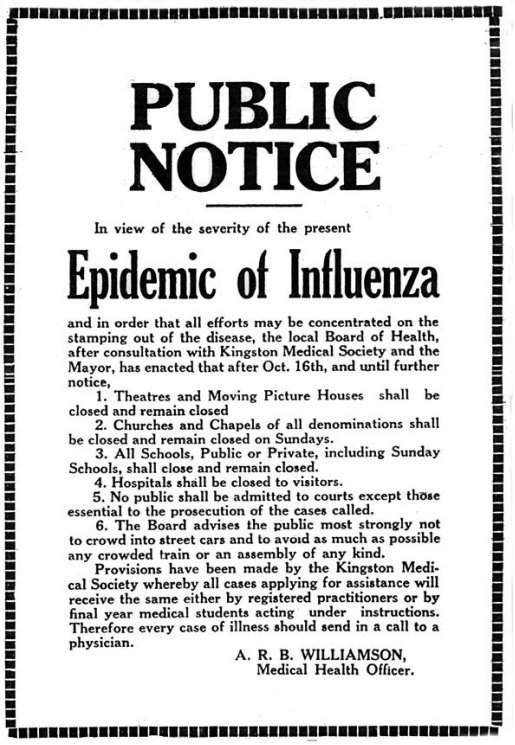
Flu pandemics or epidemics have occurred in the U.S. three times during the 20th century. In 1918-1919, the Spanish flu killed an estimated 50 to 100 million people worldwide. Approximately one-third of the world's population was infected and had clinically apparent illness.[2] In 1957-1958, the Asian flu caused 2,000,000 deaths, and in 1968-1969, the Hong Kong flu was responsible for 700,000 deaths worldwide. Both the Asian flu and the Hong Kong flu are sometimes referred to as epidemics because they were less severe than the global pandemic of 1918-1919. The current H5N1 avian flu is of great concern because the medical community believes that its mutation to a humanly transmissible form would have similar virulence to the 1918-1919 Spanish flu, a "severe" scenario. *For more information on the history of pandemic flu, see Appendix A.*

CONSIDER THIS:

As you review this document and examine the impact a flu pandemic could have on your business, it is important to keep in mind the level of social disruption that could result.

Actions will be taken by both governments and individuals focused on reducing the spread of a highly infectious disease. Government officials will be required to make decisions regarding closure of schools, public transportation, and other public places of congregation. The impact of these decisions on our normal social fabric will be significant. At the same time, individuals will be making decisions regarding the well being of themselves and their families.

Good planning and preparation, both by businesses and individuals, will provide stability and reassurance during this difficult time.



PUBLIC NOTICE

In view of the severity of the present

Epidemic of Influenza

and in order that all efforts may be concentrated on the stamping out of the disease, the local Board of Health, after consultation with Kingston Medical Society and the Mayor, has enacted that after Oct. 16th, and until further notice,

1. Theatres and Moving Picture Houses shall be closed and remain closed
2. Churches and Chapels of all denominations shall be closed and remain closed on Sundays.
3. All Schools, Public or Private, including Sunday Schools, shall close and remain closed.
4. Hospitals shall be closed to visitors.
5. No public shall be admitted to courts except those essential to the prosecution of the cases called.
6. The Board advises the public most strongly not to crowd into street cars and to avoid as much as possible any crowded train or an assembly of any kind.

Provisions have been made by the Kingston Medical Society whereby all cases applying for assistance will receive the same either by registered practitioners or by final year medical students acting under instructions. Therefore every case of illness should send in a call to a physician.

A. R. B. WILLIAMSON,
Medical Health Officer.

As a representative of Alex Lee, Inc., (see acknowledgements, page 2) expressed about their pandemic planning: "In preparing a plan, you must consider how it fits your company culture. When you come out on the backside of a potential pandemic, you want your company to be recognized—by your employees and your customers and your community—as the same company it was before the pandemic. A primary focus has to be your employees and making sure they are taken care of along with specifically dealing with business issues. You don't want to run the risk of losing your employees because the company totally changed in the face of adversity."

[2] Center for Infectious Disease Research and Policy, University of Minnesota

WILL THE H5N1 PANDEMIC OCCUR?

The Centers for Disease Control (CDC) and the World Health Organization (WHO) have stated that there is a **high probability** that an H5N1 influenza pandemic will occur and will affect the human population worldwide. The CDC says:

> "The risk of pandemic influenza is serious. With the H5N1 virus now firmly entrenched in large parts of Asia, the risk that more human cases will occur will persist. Each additional case gives the virus an opportunity to improve its transmissibility in humans and thus develop into a pandemic strain. The recent spread of the virus to poultry and wild birds in new areas further broadens opportunities for human cases to occur. While neither the timing nor the severity of the next pandemic can be predicted, the probability that a pandemic will occur has increased."

Should a humanly transmissible form of H5N1 influenza develop and spread, people will have little or no natural immunity to the virus. Efficient and sustained person-to-person transmission signals an imminent pandemic. Until a flu virus that is transmissible from human to human develops, no vaccine can be developed to provide immunity to its unique characteristics. Health officials estimate that it would take several months to develop a vaccine to fight H5N1 once it has become infectious from human to human. Complicating matters, people with flu are infectious before they show symptoms. The typical incubation period (interval between infection and onset of symptoms) for influenza is approximately 2 days. *For more information on the current H5N1 threat and challenges in vaccine development, see Appendix B.*

Comparative symptoms[3] of the common flu and a pandemic flu are:

The Common Flu	A Pandemic Flu
■ Sudden headache ■ Dry cough ■ Runny nose ■ Sore throat ■ Muscle aches (myalgia) ■ Fatigue/Malaise ■ Fever up to 104°F (40°C) ■ Most people feel better within days. Fatigue can last 2+ weeks.	Susceptibility universal as there is no immunity in general population. More severe than common flu and complications more serious including vomiting, diarrhea, rapid progressive shortness of breath, and a significantly higher mortality rate. Healthy children and adults may be at increased risk due to heightened immune system response.

It is expected that a pandemic would likely start in other parts of the world and enter the U.S. through the port of entry cities. It would then rapidly spread across the country and into rural areas. It is estimated that in this era of great mobility, the spread would happen in a matter of weeks. According to the Centers for Disease Control (CDC), a pandemic outbreak in an affected community will last about 6 to 8 weeks, and multiple waves of illness (periods during which community outbreaks occur across the country) could occur with each wave lasting 2 to 3 months. Historically, the largest waves have occurred in the fall and winter. Experts say the full effect of a pandemic could last from 18 to 24 months.

[3] Mayo Clinic

According to the CDC, an H5N1 flu pandemic could potentially kill as much as 1% of the world's population or about 65 million people. In the U.S., the CDC projects that 90 million people would become infected, resulting in between 200,000 deaths (a moderate 1958-like scenario) and 1.9 million deaths (a severe 1918-like scenario). Experts believe an H5N1 pandemic will more likely resemble a severe scenario.

According to the CDC, the "clinical disease attack rate will likely be 30% or higher in the overall population during the pandemic. Illness rates will be highest among school-aged children (about 40%) and decline with age. Among working adults, an average of 20% will become ill during a community outbreak." It is generally accepted that in a severe pandemic, up to 40 percent of the workforce would be affected during peak outbreak periods due to absenteeism attributable to illness, the need to care for ill or deceased family members, and fear of infection. Lower rates of absenteeism would occur during the weeks before and after a peak and these rates will be affected by public health measures such as school closures.[4]

While a pandemic would not affect the infrastructure directly, the fact that essential personnel may be unable to work due to illness or death will threaten such things as power supply, information networks, and the operation of public services like banks.

The following chart demonstrates where the World Health Organization (WHO) believes we are now (November 2006) in the stages of pandemic alert:[5]

Inter-pandemic phase	**Lower risk of human cases**	**1**
New virus in animals, no human cases	**Higher risk of human cases**	**2**
Pandemic Alert	**No or very limited human-to-human transmission**	**3**
New virus causes human cases	**Evidence of increased human-to-human transmission**	**4**
	Evidence of significant human-to-human transmission	**5**
Pandemic	**Efficient and sustained human-to-human transmission**	**6**

Dr. D.A. Henderson, scholar at the Center for Bioterrorism at the University of Pittsburgh and former director of the Office of Public Health Emergency Preparedness, has said that people should not be distracted by thinking that it will be possible to contain an outbreak. He uses as an example the rapidity with which the 1918 pandemic swept across the country. He warns that the biggest problem will be the extreme number of patients overwhelming healthcare facilities.[6] *For more information on pandemic planning by the medical community, features of pandemic strains, and details of pandemic phases, see Appendix C.*

---

[4] www.pandemicflu.gov (Pandemic Planning Assumptions)

[5] www.whitehouse.gov/infocus/pandemicflu

[6] "U.S. Releases Second Phase of Bird-Flu Plan," May 3, 2006, Talk of the Nation, National Public Radio

WHO WILL BE IN CHARGE?

The government released Phase Two of the National Strategy for Pandemic Influenza in May of 2006. It explains what steps the federal government will take if and when a pandemic occurs. The plan announces that the Department of Homeland Security would be in charge and would coordinate all of the other relevant federal government agencies. This could include the Department of Health and Human Services (HHS), the Centers for Disease Control and Prevention (CDC), the Federal Emergency Management Agency (FEMA), the Food and Drug Administration (FDA), the U.S. Department of Agriculture (USDA), and the Department of Defense.

The National Strategy for Pandemic Influenza states in part that the federal government will (1) try to slow down or limit the spread of a pandemic to the U.S., (2) try to limit the spread within the U.S., (3) attempt to alleviate resulting suffering and death, and (4) lessen the impact on the economy and society.

While the federal government will use "all instruments of national power" to address the pandemic threat, it expects states, communities and individual citizens to take responsibility for preparedness. It not only expects the private sector to be prepared but to "be part of the national response." Individuals should also be educated to limit the spread of the virus if they or their families should fall ill.

The Department of Health and Human Services has a plan on its website that addresses state and local responsibilities. A snapshot of these includes:

- Disease surveillance
- Disease containment
- Ongoing communication
- Psychological and social support services for emergency field workers

HHS also recommends that state and local agencies form a Coordinating Committee that will, among other things, review state and local statutory provisions concerning such things as quarantine laws, worker compensation laws, procedures for closing businesses and schools, etc.

In other words, all businesses, including foodservice distribution, should work closely with state and local departments and agencies to prepare for a pandemic. The burden of pandemic response will be on state and local health organizations. It is critical that ongoing communication and interaction with these agencies is part of every distributor's plan.

State and local contacts are available at www.pandemicflu.gov. Clicking on any state on the U.S. map (under the heading "Where You Live") will produce links to state pandemic planning information and local contacts. Information also includes federal funding allocated to the state for pandemic planning.

WHAT COULD HAPPEN?

The following bulleted items suggest possible events and situations that could result from a human flu pandemic. The items are sorted by groups affected: Consumers, Infrastructure, Government, Foodservice Distribution, and Foodservice Customers. In some cases, these are subdivided based upon reasonable groupings.

CONSUMERS

General Behaviors

- Avoid leaving home
- Overreaction and irrational behavior (a 24/7 media cycle will contribute to and exacerbate this behavior)
- Reluctance to go to work, resulting in breakdown of infrastructure due to lack of sufficient employees to keep operations running
- Insistence on going to work even though they may be contagious because they need the paycheck

Food Purchase Behaviors

- Avoid dining out
- If they do dine out, requirement to (1) see masks and gloves on servers and preparers, or (2) see some form of certification that servers and preparers are "safe," *i.e.,* have had a vaccine or have survived the flu
- Desire to buy food in bulk
- Preference for non-perishable and pre-packaged goods
- Increased use of home delivery for food and other products
- Increased demand for masks, gloves and other anti-viral items, such as sani-wipes, whether they are proven to work or not
- Demand for country-of-origin information on food products

INFRASTRUCTURE

- Restrictions on travel (air, rail, cars, trucks)
- Telecommunications failure
- Fuel shortage
- Restricted access to highways
- Interruption of public transportation
- Healthcare facilities unable to handle medical surge
- Need for trauma centers to be set up at schools, churches or other facilities
- Power failure
- Ports closed

GOVERNMENT

- Government mandates concerning the conduct of business, for example, price controls
- Local/State/Federal control of food supply and distribution
- Quarantines (primarily considered as an effective measure only in halting the initial spread of a human to human transmissible form)
- Martial law governing public activities

FOODSERVICE DISTRIBUTION

Business Disruption Issues

- Inability to conduct normal distribution because of internal issues, such as absenteeism, or because of infrastructure issues, such as road closings
- Employees not showing up to work (this could be because of illness, fear of illness, quarantine, absence of transportation, or family demands, such as children at home because of school closings)
- Incoming delivery of supplies interrupted
- Loss of business; operators closed because of public avoidance of dining out
- Fuel shortage, causing problems from delivery of goods to the need to find alternate ways to get employees to work
- Telecommunications systems and Internet systems overload during initial stages
- Security issues, *e.g.,* theft of food if public supplies get scarce
- Avoidance by consumers of poultry and swine products due to misperception of how the flu is spread

Needs Changes

- Increased needs in delivery to healthcare related customers / sites such as hospitals and nursing homes.
- Probable need for delivery of food and supplies to alternate sites, such as trauma centers set up in schools, portable feeding locations, or retail grocery stores
- Spike in demand for certain items, such as N95 masks, gowns, gloves, anti-bacterial wipes, disposables, shelf stable products, bottled water, etc.

FOODSERVICE CUSTOMERS

- Closure due to lack of business
- An increase in the demand for healthcare feeding
- Excess capacity of some operations shifted to healthcare feeding or feeding the public at points of distribution like churches or schools
- Inability to pay accounts owed
- A shift in operations, for instance from on-site eating to drive-in or delivery
- An increase in the demand for emergency items such as water or disposables by healthcare operations

PLANNING FOR A PANDEMIC

The model proposed creates three task forces: Oversight, Communications, and Operations. The structure below controls the entire planning document that follows.

EMERGENCY PREPAREDNESS ACTION TEAM

Oversight Task Force	Communications Task Force	Operation Task Force
Functions	***Functions***	***Functions***
Executives	Information Technology	Warehouse
Human Resources	Marketing	Transportation
Quality Assurance	Sales	Inbound/Outbound Logistics
Finance/Accounting	Purchasing	Security
	Food Safety	
Centers of Activity	***Centers of Activity***	***Centers of Activity***
External Relations	Communication	Receiving
Employees	Customers	Distribution
	Vendors	Supplies
		Security

INTRODUCTION — THE EMERGENCY PLANNING ACTION TEAM

The first critical action for every company/distribution center is to form an Emergency Preparedness Action Team (EPAT). The team should be made up of executives, managers, staff and line people representing each functional area. The EPAT should have a strong leader, with at least two back-up leaders identified in case of illness or death during a pandemic (or other emergency).

The Action Team should identify "trigger points" that will be the indication that certain planned actions should be initiated. For instance, when it is apparent that there is evidence of increased human to human transmission of H5N1 influenza (level 4 of the WHO chart on page 6), certain purchases such as MREs and other identified emergency supplies would be executed.

Checklists contained on the following pages are provided as a foundation for your company's discussion and planning.

Overall Responsibilities of the EPAT

Completed	In Progress	Not Started	
☐	☐	☐	Identify each potential emergency situation that could arise during an actual pandemic, predict degree of impact on the business, and rank in order of priority to predict appropriate response.
☐	☐	☐	Establish a chain of command with back-up in case of illness or death.
☐	☐	☐	Identify preparedness team and assign roles and responsibilities.
☐	☐	☐	Create a timeline of action development with priority sequencing of preparation and response.
☐	☐	☐	Plan for post-pandemic recovery.
☐	☐	☐	Identify who "owns" each activity. Ensure that there is accountability.
☐	☐	☐	Determine all proactive steps that can be taken to minimize emergencies and responses during pandemic.
☐	☐	☐	Work with other task forces to create planning deadlines. Develop a budget to fund all planning and emergency response activities.
☐	☐	☐	Develop flow chart of responses to pandemic as it progresses.
☐	☐	☐	Predict needed staffing levels; work with other task forces to identify all essential and non-essential functions during a pandemic; look at ways that underutilized staff can be utilized in other areas.
☐	☐	☐	Ensure emergency communication capability, with multiple back-ups.
☐	☐	☐	Meet with healthcare officials to establish the need for foodservice workers to receive vaccines and other anti-viral measures that may be in short supply. (There will be a number of industries saying they are essential. Medical personnel, law enforcement, and first responders will be the first in line to receive vaccine once available.)
☐	☐	☐	Collaborate with other distributors on communicating with government officials; speak as one industry voice.

TASK FORCES — RESPONSIBILITIES & CENTERS OF ACTIVITY

The proposed EPAT should break into small task forces focused on particular activities. Each task force should have specific roles and responsibilities related to its identified activities.

As illustrated at the start of this section (page 13), the model in this planning document is based on three task forces. It suggests which distribution functions could be included on each task force. It provides guidelines for **Responsibilities** for each task force and provides **Centers of Activity** with **Actions** for each task force. The Centers of Activity provide a list of issues to be addressed by that task force.

These task forces include:

- Task Force 1 - Oversight
- Task Force 2 - Communications
- Task Force 3 - Operations

TASK FORCE 1 - OVERSIGHT

This group would be responsible for global issues that could affect the company, other members of the supply chain and the community at large. It would also coordinate the activities of the other two task forces.

It will be particularly important for this task to anticipate disabling external events and work out contingency plans to minimize their impact.

Distributors should anticipate such events and

(1) Create emergency response action plans to minimize and manage the impact of unavoidable consequences such as employees not showing up to work, restricted access to highways, telecommunications overload, etc.

(2) Work with government and other relevant officials to ensure that distributors do not become victim to policies based on misperceptions of the importance of foodservice distribution to stability and meeting basic societal needs.

Functions to be Represented on the Oversight Task Force are:

- Executive
- Human Resources
- Quality Assurance
- Finance/Accounting

Responsibilities - Oversight Task Force

Completed	In Progress	Not Started	
❑	❑	❑	Identify who can work from home. Work with other task forces to determine the process for conducting business at home, *e.g.,* transporting data, etc. (It must be recognized that capacity may be an issue for electronic communications during the initial stages of a pandemic.)
❑	❑	❑	Plan with Information Services for needed additional computer capacity to handle people working at home.
❑	❑	❑	Plan for possible reallocation of employees, facilities, and fleet. Consider all worst-case scenarios for the redeployment of assets, such as use of refrigerated trucks for bodies.
❑	❑	❑	Identify and address all legal issues surrounding emergency actions.
❑	❑	❑	Be prepared to aid other activities, such as feeding healthcare workers.
❑	❑	❑	Prepare to have to deliver to alternate food points, such as trauma centers set up in school buildings or portable kitchens.
❑	❑	❑	Plan for possible lawsuits arising from emergency actions.
❑	❑	❑	Begin formal cross training for critical functions, like selecting. Management, office staff, and sales people could work in the warehouse, for instance. (Note: It will be most difficult to cross train drivers as Commercial Drivers Licenses and experience are needed.)
❑	❑	❑	Identify volunteers who could come to work in place of missing employees. These could be retired or former employees or family members. Add skill level and availability of volunteers as part of database of employees. Training programs should be developed that expedite training procedures. Volunteers should be trained.
❑	❑	❑	Consider that you may need screening procedures for employees who come to work. This would entail having a medical person on site. Consider providing a "wellness badge" for those who either have survived the flu or have been inoculated. Take note of potential constraints on medical examinations of employees found in the Americans with Disabilities Act, and the confidentiality constraints of the ADA, HIPAA and comparable state laws, and consult with legal counsel as appropriate.
❑	❑	❑	Consider whether the company will need to house critical employees on site or in nearby facilities.
❑	❑	❑	Establish policies for sanitation, such as proper handwashing, best practices for coughing or sneezing, and social distancing.

Responsibilities - Oversight Task Force (continued)

Completed	In Progress	Not Started	
❑	❑	❑	Consider that the company may need to supply food and personal supplies to employees.
❑	❑	❑	Prepare for negative perception of poultry and swine. Be ready to provide education that you can not get the flu from eating properly cooked chicken or pork. Offer alternate proteins for center-of-the-plate.
❑	❑	❑	Increase borrowing capacity to survive crisis. Determine the amount of cash you will need to have on hand.
❑	❑	❑	Plan for disrupted accounts receivable/accounts payable, and the credit/debit network.
❑	❑	❑	Determine the impact of pandemic relative to insurance and to pension funds.
❑	❑	❑	Review insurance coverage.
❑	❑	❑	Ascertain if there will be economic relief afterwards, for example, business loss insurance.
❑	❑	❑	If the company donates items for relief program, keep track of what, how much, and to whom in case of future reimbursement.

Centers of Activity - Oversight Task Force

EXTERNAL RELATIONS ISSUES

ASSUMPTION: It is extremely important that the Emergency Preparedness Action Team appoints several employees to be liaisons with officials in federal, state, and local departments and agencies to understand the entire scope of preparedness that is underway. These organizations will provide guidance in preparedness measures. It is also important that government entities take into account the capabilities and the issues pertaining to foodservice distribution. It is critical that distributors have a voice in decisions and processes that could affect their ability to continue operations during a pandemic or even to assist the community in pandemic response measures.

ACTIONS

Completed	In Progress	Not Started	
❑	❑	❑	Determine the importance of the role of each function involved in pandemic preparedness in the local, state, and federal government.
❑	❑	❑	Become familiar with state and local government functions that are working on pandemic preparedness; create a dialog with officials that will also serve to educate them about the business of foodservice distribution, *i.e.,* what distributors will need to do during a pandemic to serve their customers and what they could do to help distribution of emergency supplies.
❑	❑	❑	Identify local and state government emergency plans and the preparation status of local, regional, and state health officials. Build relationships and collaborate with health officials and any government functions that may have responsibility during a pandemic. Learn what they envision during a pandemic and how that would affect your operation. Educate them about the activities and capabilities of the foodservice distribution industry.
❑	❑	❑	Identify who decision-makers will be for giving vaccines; establish priority status of warehouse workers and drivers for early immunization.
❑	❑	❑	Build external relationships with competitors and wholesale and retail grocers in case you need to collaborate during pandemic. (Example - You might share warehouse workers with a competitor or ship foodservice quantities to retail grocer for consumer distribution).

Centers of Activity - Oversight Task Force

EMPLOYEE ISSUES

ASSUMPTION: Recognize that employee absenteeism could be your biggest challenge in continuing operations. Employees may stay home due to illness or death in the family, fear of becoming ill, transportation problems, quarantine, or because schools are closed and their children are at home.

ACTIONS

Completed	In Progress	Not Started	
❑	❑	❑	Create an employee database and keep it current, with contact numbers (phone, email, address).
❑	❑	❑	Establish how you will screen workers for illness during a pandemic; consider having a nurse or physician on site.
❑	❑	❑	Cross train employees to cover critical positions during a pandemic, such as order filling or unloading.
❑	❑	❑	Educate employees about the flu; identify risks; prepare them to make informed decisions.
❑	❑	❑	Establish policies in advance for sick leave, flexible hours. (Example - If there is no sick leave established, a sick employee might be compelled to come to work and infect others.)
❑	❑	❑	Research health coverage available for employees, for instance, what screenings are covered.
❑	❑	❑	Create educational material for employees, including how to contact Red Cross, what kind of help will be available (Note: All educational material should be vetted by lawyer to ensure accuracy and to prevent liability.)
❑	❑	❑	Help employees prepare for their households, *i.e.,* what they need to store, etc. Advise them on how to take care of "staple needs" like food, water, etc.
❑	❑	❑	Set up direct deposit or credit card system for all employees well before a pandemic or other emergency occurs.
❑	❑	❑	Establish proper prevention habits ahead of time, such as use of hand sanitizers, social distancing, sneezing or coughing into the elbow, etc.
❑	❑	❑	Provide employees with information for at-home care of flu victims.
❑	❑	❑	Advise employees to keep an extra supply of any medications they need to take.
❑	❑	❑	Recommend that employees stock a supply of food and water for a one-week minimum, preferably two weeks. This should be shelf-stable food, such as canned fruit or vegetables, soup, etc.

Task Force 2 - Communications

This group would be responsible for all written, verbal, print, and electronic communication with employees, customers, and vendors. Communication would range from education prior to a pandemic to emergency contact during a pandemic. It would include obtaining the pandemic preparedness plans of vendors and customers pre-pandemic as well as placing and taking orders and emergency contact during a pandemic.

Suggested functions to be represented on this task force are:

- Information Services/Technology
- Marketing
- Sales
- Purchasing
- Food Safety
- Administrative

Responsibilities - Communications Task Force

Completed	In Progress	Not Started	
			General Communications Issues
❑	❑	❑	Identify credible official sources of pandemic information. The most centralized location for federal, state, and local information is through www.pandemicflu.gov.
❑	❑	❑	Establish a crisis hotline for all constituencies: employees, customers, vendors.
❑	❑	❑	Educate employees and customers about what a pandemic would mean and how your company plans to prepare and respond. The goal is to make them as psychologically ready for a pandemic as possible and convey that you will do everything possible to create stability for employees and customers.
❑	❑	❑	Establish process for transporting data to alternative worksites, with backup.
❑	❑	❑	Determine impact if computer service is interrupted. Establish process of restoring service.
❑	❑	❑	Anticipate a price freeze.
			Internal Communications Issues
❑	❑	❑	Give employees information that will let them know what is expected of them (leave, wellness, sanitizing procedures, etc.). Provide emergency response training for all employees.
❑	❑	❑	Coordinate pandemic response training with employees.
❑	❑	❑	Determine extent of extra capacity for information systems and back-up that might be needed to handle employees working from home.

Responsibilities - Communications Task Force (continued)

Completed	In Progress	Not Started	
			Customer Related Issues
❑	❑	❑	Obtain customers' crises plans and formalize contact at customer location.
❑	❑	❑	Initiate a program of customer awareness training. This could be accomplished by sales reps during regular visits, and should be represented at your food shows. The issue is to do so in a timely manner.
❑	❑	❑	Identify all possible contingencies for customers, for example, government-mandated triage areas at schools.
❑	❑	❑	Determine from healthcare operators how they will handle the preparation of the high volume of meals necessitated by a pandemic and appropriate diet for influenza victims.
❑	❑	❑	Identify core products that would be in higher demand by customers such as shelf-stable foods, portable water, etc. Identify and stock additional products that may be needed such as masks, disposables, sanitizers effective against virus, single-use serviceware, etc.
❑	❑	❑	Develop alternative method for communicating orders to customers.
❑	❑	❑	Provide multiple contact numbers to customers for reaching sales personnel or drivers in an emergency.
❑	❑	❑	Have Country of Origin data on all products ready for customer demand.
			Vendor Related Issues
❑	❑	❑	Obtain vendors' crises plans.
❑	❑	❑	Identify all vendors of products that would be essential during a pandemic.
❑	❑	❑	Consider that products may be diverted to retail grocers for bulk purchasing by the public.
❑	❑	❑	Stock up on MREs (Meals Ready to Eat) based upon needs assessment.
❑	❑	❑	Develop alternative method for communicating orders to vendors.
❑	❑	❑	Identify alternate local fuel vendors in case of fuel shortages.

Centers of Activity - Communications Task Force

COMMUNICATIONS ISSUES

Assumption: Communication with employees, customers, vendors, and the media will be critical to preventing disruption of business. It will be particularly important to help Human Resources staff, as they will bear the burden of these responsibilities.

ACTIONS:

Completed	In Progress	Not Started	
❑	❑	❑	Create an emergency communication process that would operate during a pandemic. This would include a phone tree, email, and website postings.
❑	❑	❑	Make certain that the team is able to obtain up-to-date, accurate information about the pandemic and any government mandates. Create a place to post this information on the website so that all employees can access it.
❑	❑	❑	Post a flu pandemic FAQ sheet on the company website that employees and customers can download; make hardcopies available as well.
❑	❑	❑	Identify one executive (with backups in case of illness or death) who can communicate with the media; make sure the spokesperson has public relations/media exposure training.
❑	❑	❑	Advise employees that they should not communicate with the media about any company activity related to pandemic planning or response.
❑	❑	❑	Prepare press releases about what the company is doing to plan for a pandemic and what it is doing during a pandemic, particularly on the topic of food supply and food safety.
❑	❑	❑	Provide links to healthcare organizations on the website for employees and customers.

Centers of Activity - Communications Task Force

CUSTOMER ISSUES

Assumption: Distributors will want to know, as much as possible, how customers plan to continue some form of operation during a pandemic. For instance, a fast food restaurant may plan to keep its window service operating. On the other hand, a fine dining establishment may plan to shut down for a significant timeframe during a pandemic. Healthcare and prison foodservice operators will have to remain in operation.

ACTIONS

Completed	In Progress	Not Started	
☐	☐	☐	Identify all customers who would be critical during a pandemic, such as hospitals, nursing homes or penal institutions and become involved in their planning in order to meet their needs effectively.
☐	☐	☐	Plan method for keeping in contact with customers as pandemic progresses.
☐	☐	☐	Utilize sales reps to be points of information about company plans; they can also bring information back to the company about customers' activities before and during a pandemic.
☐	☐	☐	Educate customers about your plans and preparedness.
☐	☐	☐	Determine customers' pandemic plans.
☐	☐	☐	Identify customers' priorities: What are their intentions? Do they plan to stay open? Will they only operate takeout? What will they need from your company?
☐	☐	☐	Consider how product mix might change, with greater emphasis on disposables and critical items like water or chemicals.
☐	☐	☐	Work with customers that plan to remain open to reduce the number of deliveries.
☐	☐	☐	Plan for accounts receivable issues. You may have to write off a considerable amount of business.
☐	☐	☐	Review existing contracts with healthcare and government customers for such things as agreements to supply storage in case of an emergency or other obligations.
☐	☐	☐	Consider how customers could unload their deliveries in case drivers do not want to risk contact and you have to drop ship; consider key drops.

Centers of Activity - Communications Task Force

VENDOR ISSUES

Assumption: It will be important to communicate with vendors well in advance of a pandemic to identify potential threats to ordering and receiving of necessary products.

ACTIONS

Completed	In Progress	Not Started	
❑	❑	❑	Identify alternate vendors that are in closer proximity in case fuel is in short supply and long-distance deliveries are curtailed.
❑	❑	❑	If repair and maintenance services are outsourced, identify alternate companies for service during a pandemic.
❑	❑	❑	Educate vendors about your plans and preparedness.
❑	❑	❑	Identify all vendors' pandemic preparedness plans.
❑	❑	❑	Identify receiving process if vendor drivers will not unload; agree on charges if warehouse employees have to unload; review processes for unloading to limit facility access.
❑	❑	❑	Communicate with brokers about potential need for different mix of products during pandemic.
❑	❑	❑	Develop alternative method for communicating orders.
❑	❑	❑	Develop alternative methods of delivery, for example, to an off-site location for pick-up and transfer of goods.

Task Force 3 - Operations

This group would be responsible for all aspects of physical distribution, from the warehouse to transportation. This team would be the hardest hit during a pandemic as it requires physical activity that must be executed on site. Careful preplanning for all contingencies, especially a severely reduced work force, will be extremely important.

Suggested functions to be represented on this task force are:

- Warehouse
- Transportation
- Inbound and Outbound Logistics
- Security

Responsibilities - Operations Task Force

Completed	In Progress	Not Started	
			Facility and Fuel Issues
❑	❑	❑	Insure sufficient generators in case of power outages.
❑	❑	❑	Anticipate fuel shortages.
			General Workforce Issues
❑	❑	❑	Prioritize critical operations employee functions, create contingencies for no-shows and greatly reduced work force.
❑	❑	❑	Work with the Oversight Task Force to institute cross-training for warehouse and transportation jobs.
❑	❑	❑	Plan work schedules with reduced staff.
❑	❑	❑	Establish specific plans for drivers, especially how the company will find and employ additional drivers during a pandemic.
			Contagion Issues
❑	❑	❑	Establish guidelines for pickers and other warehouse and transportation staff to diminish the chain of contagion from one shift to another. Guidelines should also be established for forklifts, truck cabs, hand dolleys, face to face contact, sanitation stations, etc.
❑	❑	❑	Adjust procedures to minimize contact between drivers (inbound and outbound) and warehouse personnel.
❑	❑	❑	Train employees in proper sanitation methods.
			Delivery/Product Issues
❑	❑	❑	Establish policy regarding out-of-date products or perishables during pandemic.
❑	❑	❑	Regulate the drawing of products during pandemic.
❑	❑	❑	Plan alternate customer delivery methods to minimize human contact.
❑	❑	❑	Conduct backhauls to address shortages and delivery difficulties.
❑	❑	❑	Anticipate alternative deployment of rolling stock, for instance being shifted to assist grocery distribution.
❑	❑	❑	Consider that delivery could be complicated because of territories crossing city, county or state lines where different regulations might be established and plan strategy to address.

Responsibilities - Operations Task Force (continued)

Completed	In Progress	Not Started	
			Security Issues
❑	❑	❑	Determine who has access to the warehouse and provide credentials for entry.
❑	❑	❑	Plan for the need for extra security for drivers who are distributing food during a pandemic.
❑	❑	❑	Plan for additional security for the warehouse and any storage facilities.
❑	❑	❑	Consider police escort for drivers (recognize that police forces will be under duress from the same shortages of personnel you are experiencing as well as abnormal social unrest).

Centers of Activity - Operations Task Force

SUPPLY CONSIDERATIONS

Assumption: It will be important to identify critical supplies that will be needed during a pandemic, make preparation for purchasing, storing and distributing them, and acquire knowledge for training staff in proper use of items such as N95 masks. These critical supplies relate to both internal staff or for customers.

ACTIONS

Completed	In Progress	Not Started	
			General Issues
❑	❑	❑	Identify critical supplies and stockpile, such as water, gloves, gowns, N95 masks, sanitizing chemicals, disposables. This should be done in coordination with purchasing and sales.
❑	❑	❑	If utilizing N95 masks or other items OSHA views as "respirators," be acquainted with regulatory requirements adopted for those items by that agency.
❑	❑	❑	Identify several alternate sources and substitutes for critical products.
❑	❑	❑	Put core supplies in protected area where they will not be picked prior to pandemic.
❑	❑	❑	Plan for increase in demand for ready-to-use, heat 'n' serve items.
❑	❑	❑	Consider what the company will do if ports are closed and imported products are not available.
			Fuel Issues
❑	❑	❑	Plan for a fuel shortage; keep tank supplied; develop relationship with refiner.
❑	❑	❑	Consider that government or National Guard could commandeer fuel.
❑	❑	❑	Make sure power units are topped off.

Centers of Activity - Operations Task Force

SECURITY CONSIDERATIONS

Assumption: Security could become a big issue, depending on how the infrastructure responds to the public's need for food. If there are food shortages, there could be "hi-jacking" or robbery of truckloads of food. There also could be attempts at breaking into a warehouse. In addition, there is a heightened potential for employee theft. It will be advisable to plan for extra security measures during the various stages of the pandemic.

ACTIONS

Completed	In Progress	Not Started	
❑	❑	❑	Ensure security in warehouse, with back-up plans in case of disruption of usual security measures due to absenteeism or infrastructure problems.
❑	❑	❑	Plan for protecting drivers: consider sending an additional staff member with the driver (possibly staff with military or security background); educate them about not resisting if they are held up.
❑	❑	❑	Use alternate routes and times of delivery.
❑	❑	❑	Consider camouflaging trucks to prevent hi-jacking.
❑	❑	❑	Consider a police escort for drivers if necessary and feasible.

Appendix A - Historical Perspective

Provides a medical perspective of influenza pandemic.

Excerpts, October 2006 from the website of
Center for Infectious Disease Research & Policy, University of Minnesota
http://www.cidrap.umn.edu/cidrap/content/influenza/panflu/biofacts/panflu.html

Historical Perspective

Earliest reports of influenza epidemics date back to 412 BC and were recorded by Hippocrates. A number of epidemics that likely were influenza were described in the Middle Ages, and one that was probably a true pandemic took place in 1510 (see References: Beveridge 1978). Other key historical facts include the following:

- One of the earliest recorded pandemics occurred in 1580. Like the 1918 pandemic, this one was particularly severe. It started in Asia and spread to Africa, Europe, and the Americas. In 6 weeks it afflicted all of Europe. Death rates were high; 9,000 of 80,000 people died in Rome, and some Spanish cities were described as "nearly entirely depopulated" by the disease (see References: Beveridge 1978).
- Ten pandemics have been recorded in the past 300 years. During this time, 10 to 49 years has occurred between pandemics with an average of 24 years.
- During the 17th century, localized epidemics were reported, and in the 18th century at least three pandemics occurred (1729-30, 1732-33, and 1781-82).
- Three influenza pandemics occurred during the 19th century (1830-31, 1833-34, and 1889-90). The 1889 pandemic known as the Russian Flu began in Russia and spread rapidly throughout Europe. It reached North America in December 1889 and spread to Latin America and Asia in February 1890. About 1 million people died in this pandemic.

Global influenza surveillance was established in 1947 by WHO to better understand the epidemiology of influenza and to obtain isolates in a systematic fashion for annual vaccine development (see References: Hampson 1997).

Pandemics of the 20th Century

Three pandemics occurred during the 20th century, caused by an H1, an H2, and an H3 strain. These are outlined in the table below and then briefly summarized. Currently, H1 and H3 influenza strains are circulating in the human population. Scientists have raised concern about the possibility of H2N2 reemerging (also referred to as recycling) in humans, particularly through accidental release of a laboratory strain (see References: Dowdle 2006).

Date: 1918-19 (Spanish Flu)
Strain: H1N1
Estimated No. of Deaths in US: 500,000
Comments: Global mortality may have been as high as 100 million. The virus likely originated in the US and then spread to Europe.

Date: 1957-58 (Asian Flu)
Strain: H2N2
Estimated No. of Deaths in US: 60,000
Comments: The virus was first identified in China; approximately 1 million people died globally during this pandemic.

Date: 1968-69 (Hong Kong Flu)
Strain: H3N2
Estimated No. of Deaths in US: 40,000
Comments: The death rate from this pandemic may have been lower because the strain had a shift in the hemagglutinin (H) antigen only and not in the neuraminidase (N) antigen.

*All three pandemics were characterized by a shift in age distribution of deaths to younger populations under age 65 (at least initially); shift was particularly dramatic during the 1918 pandemic (see References: NIAID: Focus on the flu; HHS: Influenza pandemics; Kilbourne 2006; Simonsen 2004; Webster 1997).

1918-19 (Spanish Flu)

This pandemic was caused by an influenza A (H1N1) strain. Worldwide, about one third of the world's population was infected and had clinically apparent illness (about 500 million people) and an estimated 50 to 100 million died (see References: Johnson 2002, Taubenberger 2006). Earlier estimates implied that the death toll was 20 to 40 million, but more recent evidence supports the higher figures. Adjusting for today's population, a similar pandemic would yield a modern death toll of 175 to 350 million.

- The pandemic began with a relatively mild "herald" wave in the spring of 1918. During that time, outbreaks were reported in Europe and in the United States (particularly in military training camps for new recruits headed to the war in Europe) (see References: Reid 2001, Glezen 1996).
- Many investigators believe that the strain originated in the United States (perhaps in rural Kansas) and then migrated initially to France before spreading throughout Europe (see References: Barry 2004). However, others believe that the strain may have been circulating in the Mid-Atlantic States as early as February of 1918 (see References: Simonsen 2004). Furthermore, an outbreak of severe respiratory disease occurred in an army camp in France in 1916-17 (see References: Oxford 2000). A significant clinical feature of the disease was cyanosis, which also was a predominant finding among those who acquired the pandemic strain of influenza. It is possible that this outbreak represented H1N1 infection and was an early precursor to the pandemic. At any rate, it is clear that the 1918-19 pandemic did not begin in Asia, although the origin of the implicated H1N1 strain still remains a mystery.
- This first wave was followed by two additional waves in the fall and winter of 1918-19 that were much more severe (see References: Taubenberger 2006). The second highly virulent wave spread rapidly around the world in the fall of 1918; it took only 2 months for the pandemic to circle the globe at that time.
- Recorded case-fatality rates varied around the globe. In the US military, death rates ranged from 5% to 10% (see References: Barry 2004). Higher rates were reported in some areas.
- Additional waves that were not as severe occurred in 1919 and 1920.

An unusual feature of the pandemic was the age-related mortality; the pandemic strain killed a disproportionate number of healthy young adults. This led to the observation of a "W" shaped age-related mortality curve in the United States, with high rates of mortality among very young children, persons 15 to 45 years of age, and the elderly (see References: Reid 2001; Glezen 1996). Usually the curve associated with influenza mortality follows a "U" shape, with excess deaths occurring only among the very young and the elderly. One striking feature of the pandemic was its impact on pregnant women; a summary of 13 studies involving pregnant women demonstrated that case-fatality rates ranged from 23% to 71% (see References: Barry 2004).

In October 2005, CDC reported that scientists had reconstructed the 1918 pandemic H1N1 strain and tested it in mice (see References: Tumpey 2005). They found that mice infected with the 1918 strain died in as little as 3 days, and mice that survived as long as 4 days had 39,000 times as many virus particles in their lungs as did mice infected with a control influenza virus, a Texas strain of H1N1 from 1991. All the mice infected with the 1918 virus died, while those exposed to the Texas strain survived. Further, the 1918 virus was at least 100 times as lethal as an engineered virus that contained five 1918 genes and three genes from the Texas H1N1 strain. The researchers found that the mice had severe inflammation in their lungs and bronchial passages, findings very similar to those in people who died of the 1918 virus.

Earlier studies in mice using genetically engineered influenza strains similar to the H1N1 1918 pandemic strain suggest that macrophage activation with high levels of cytokine production may have been a key factor in lung damage caused by the pandemic strain (see References: Kobasa 2004). Investigators have postulated that an overly robust immune response inducing a "cytokine storm" may have contributed to the high case-fatality rates seen in younger populations during the 1918 pandemic.

Recent genetic sequencing of the 1918 strain indicates that the strain was of avian origin and that the strain did not reassort with a human strain (unlike later pandemics), but rather gradually adapted to humans until it could be efficiently transmitted person to person (see References: Taubenberger 2005). Current evidence indicates that the 1918 virus was an avian-like virus derived in toto from an unknown source (see References: Taubenberger 2006).

1957-58 (Asian Flu)

The Asian flu was caused by an H2N2 strain and originated in China. The virus was initially isolated in Singapore in February 1957 and in Hong Kong in April of that year. The pandemic spread to the Southern Hemisphere during the summer of 1957 and reached the United States in June 1957 (see References: Glezen 1996). The pandemic strain acquired three genes from the avian influenza gene pool in wild ducks by genetic reassortment and obtained five other genes from the then-circulating human strain.

About 69,800 people in the United States died and mortality was spread over three seasons. Overall, the highest mortality rates occurred among the elderly; however, during the initial season in 1957, nearly 40% of the influenza deaths occurred among persons less than 65 years of age (see References: Simonsen 2004). The high case-fatality rate in this age-group declined in subsequent years. Globally, approximately 1 million people died during this pandemic.

1968-69 (Hong Kong Flu)

The Hong Kong flu was caused by an H3N2 strain. The strain acquired two genes from the duck reservoir by reassortment and kept six genes from the virus circulating at the time in humans.

During the pandemic, about 33,800 people died in the United States. The death rate from this pandemic may have been lower because the strain had a shift in the hemagglutinin (H) antigen only and not in the neuraminidase (N) antigen. Although antibodies to neuraminidase antigen do not prevent infection, they may modify the severity of disease (see References: Glezen 1996). Also, an H3 strain had apparently circulated in the United States around the turn of the century, so elderly persons may have had some protective antibody from past exposure to an H3 strain (see References: Simonsen 2004). This could have caused a lower fatality rate in the elderly.

Lessons from Past Pandemics

In a recent report issued in January 2005, WHO officials identified key lessons from the three pandemics of the past century (see References: WHO: Avian influenza: assessing the pandemic threat). These lessons are summarized as follows.

- Pandemics behave as unpredictably as the viruses that cause them. During the previous century, great variations were seen in mortality, severity of illness, and patterns of spread.
- One consistent feature important for pandemic preparedness planning is the rapid surge in the number of cases and their exponential increase over a very brief time, often measured in weeks.
- Apart from the inherent lethality of the virus, its capacity to cause severe disease in non-traditional age groups, namely young adults, is a major determinant of a pandemic's overall impact.
- The epidemiologic potential of a virus tends to unfold in waves. Subsequent waves have tended to be more severe.
- Virologic surveillance, as conducted by the WHO Laboratory Network, has performed a vital function in rapidly confirming the onset of pandemics.
- Most pandemics have originated in parts of Asia where dense populations of humans live in close proximity to ducks and pigs.
- Some public health interventions may have delayed the international spread of past pandemics, but could not stop them.
- Delaying spread is desirable, as it can flatten the epidemiological peak, thus distributing cases over a longer period of time.
- The impact of vaccines on a pandemic, through potentially great, remains to be demonstrated. In 1957 and 1968, vaccine manufacturers responded rapidly, but limited production capacity resulted in the arrival of inadequate quantities too late to have an impact.
- Countries with domestic manufacturing capacity will be the first to receive vaccines.
- The tendency of pandemics to be most severe in later waves may extend the time before large supplies of vaccine are needed to prevent severe disease in high-risk populations.
- In the best-case scenario, a pandemic will cause excess mortality at the extremes of the life span and in persons with underlying chronic disease. Countries with good programs for yearly influenza vaccinations will have experience with the logistics of vaccinations for these populations.

Appendix B - Current H5N1 Threat / Vaccine Development

Provides a medical perspective of influenza pandemic.

Excerpts, October 2006 from the website of
Center for Infectious Disease Research & Policy, University of Minnesota
http://www.cidrap.umn.edu/cidrap/content/influenza/panflu/biofacts/panflu.html

The Current H5N1 Threat

According to WHO, at this time the pandemic alert level for H5N1 influenza is at Phase 3: a new viral subtype is causing disease in humans but is not yet spreading efficiently and sustainably (see References: WHO: Current WHO phase of pandemic alert).

Detailed information about H5N1 influenza in bird populations can be found in the document on this Web site "Avian Influenza (Bird Flu): Agricultural and Wildlife Considerations" and in human populations in the document "Avian Influenza (Bird Flu): Implications for Human Disease."

Of the avian influenza subtypes, currently the H5N1 subtype is of greatest pandemic concern for the following reasons (see References: WHO: Avian influenza fact sheet; WHO: Influenza pandemic preparedness and response):

- H5N1 viruses have spread rapidly throughout poultry flocks in Asia over the past 2 years and now appear to be endemic in eastern Asia (see References: Kaye 2005, Li 2004). In addition, H5N1 viruses have spread beyond Asia via migratory birds to several countries in Europe and Africa and to India.
- H5N1 strains cause severe disease in humans, with a high case-fatality rate (reportedly at over 50%, although adequate surveillance data are lacking to accurately define the rate).
- The potential of exposure and infection of humans is likely to be ongoing in rural Asia and probably in Africa as well, where many households keep free-ranging poultry flocks for income and food (see References: Stohr 2005).
- Recent genetic sequencing performed on H5N1 viral isolates from Turkey demonstrates that the strains contain two mutations which may make the virus better adapted to humans (see References: Butler 2006). These mutations could potentially enhance transmission from birds to humans and between humans.

Genetic characterization of H5N1 viruses has demonstrated two distinct phylogenetic clades (genetic groups) (see References: WHO: Antigenic and genetic characteristics of H5N1 viruses and candidate H5N1 vaccine viruses developed for potential use as pre-pandemic vaccines). Clade 1 viruses have circulated in Cambodia, Thailand, and Vietnam and clade 2 viruses have circulated in China and Indonesia and have spread westward to the Middle East, Europe, and Africa. Six different subclades of clade 2 have been recognized and three of these have been responsible for most of the human cases in Indonesia, China, and outside of Asia.

If H5N1 strains continue to circulate widely among poultry, the potential for emergence of a pandemic strain remains high. For example, H5N1 viruses have been found in pigs in southern China, and human H3N2 influenza viruses are endemic in pigs in that area. H5N1 has recently been reported in pigs in Indonesia as well (see References: Cyranoski 2005). Thus, the conditions exist for exchange of genetic material between the different viruses in the pig host (see References: Li 2004; WHO: Avian influenza: update: implications of H5N1 infections in pigs in China). Some scientists believe that reassortment between an avian and a human strain could occur in the human population without an intermediary host; if this proves true, as more humans become exposed and infected, the potential for reassortment with a human strain also may increase. Similarly, as more human cases occur globally and the virus gains a foothold in the human population, the potential for gradual adaptation of the virus into a human pandemic strain increases (see References: WHO: Influenza pandemic preparedness and response 2005).

Since 2003, human cases of H5N1 influenza have been reported in Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Thailand, Turkey, and Vietnam.

- WHO has officially recognized more than 250 cases (see References: WHO: Cumulative number of confirmed human cases of avian influenza), with an overall case-fatality rate of more than 50%. The reported case-fatality rate among cases in Indonesia is higher, at approximately 75%.
- An epidemiologic report on 203 confirmed H5N1 influenza cases published by WHO in June 2006 demonstrated that the median age of cases was 20 years and that 90% of infections occurred in persons under 40 years of age (see References: WHO: Epidemiology of WHO-confirmed human cases of avian A(H5N1) infection).

The high case-fatality rate suggests that the pathogenicity of H5N1 may be similar to the 1918 H1N1 pandemic strain. Researchers have hypothesized that cytokine storm (ie, overproduction of cytokines) may have played an important role in the pathogenesis of the 1918 pandemic strain. A laboratory-based study involving H5N1 strains taken from ill humans in Asia (during 1997 and 2004) and an ordinary current H1N1 strain (circulating in Asia in 1998) found that all the H5N1 viruses caused human alveolar cells and bronchial epithelial cells to secrete significantly higher levels of various cytokines and chemokines than did the ordinary virus (see References: Chan 2005). Another recent study demonstrated a strong induction of chemokines and their receptors in macrophages infected by H5N1 and H9N2 avian influenza viruses (see References: Zhou 2006). Finally, a recent case series reported from Vietnam involving patients with H5N1 influenza showed that high viral load and high chemokine and cytokine levels are central to the pathogenesis of H5N1 influenza (see References: de Jong 2006). These findings support the role of cytokine storm in the pathogenesis of H5N1.

To date, sustained person-to-person transmission has not been recognized, although probable person-to-person spread was identified in Thailand involving transmission from an ill child to her mother and aunt (see References: Ungchusak 2005) and several other familial clusters have been recognized (see References: Olsen 2005). In May 2006, WHO reported an H5N1 influenza cluster in Indonesia involving seven cases of person-to-person transmission; one of the cases involved two generations of transmission (see References: WHO: Avian influenza: situation in Indonesia: update 14, and see May 24, 2006, CIDRAP News story). Inefficient transmission of current H5N1 strains may be related to lack of appropriate avian virus cell receptors in the upper respiratory tracts of humans and the inability of H5N1 strains to recognize human cell receptors (see References: Shinya 2006). A mutation allowing H5N1 avian influenza virus to recognize human cell receptors could enhance person-to-person transmission owing to the potential for greater viral replication in the upper respiratory tract.

Public health officials are closely monitoring the ongoing occurrence of H5N1 avian influenza in humans and watching for the emergence of a strain capable of causing sustained human-to-human transmission.

Vaccine Development

Development of an effective vaccine is considered the cornerstone for controlling a global influenza pandemic. In general, if a novel strain occurs without adequate warning, WHO has indicated that it will take at least 4 to 6 months to develop a vaccine (see References: WHO: WHO global influenza preparedness plan 2005). However, there are several major obstacles in producing an adequate vaccine supply during a pandemic:

- Limited production capacity
- Production capability in only a few countries, which will yield an inequitable distribution
- Technological challenges to vaccine development

Limited Production Capacity

For the period 2000 to 2003, global annual influenza vaccine production ranged from approximately 230 million doses of trivalent vaccine (2000) to 291 million doses (see References: Fedson 2004: Pandemic influenza vaccine: obstacles and opportunities; Medema 2004).

- In the "best case scenario," assuming that the pandemic vaccine would be a single-dose monovalent vaccine requiring the same level of antigen per dose (15 mcg HA), the production capacity would be increased to an estimated 750 million doses each year (see References: WHO: Consultation on priority public health interventions before and during an influenza pandemic).
- In the United States, domestic production was estimated at 50 million doses of trivalent vaccine during 2004. This would be equivalent to about 150 million doses of monovalent standard-dose, assuming 15 mcg HA per dose (see References: Fedson 2003).
- Two critical caveats need to be considered with these types of estimates: (1) it is not clear how many micrograms of antigen will be necessary to elicit an immune response to a pandemic strain (it may be that 30 to 90 mcg per dose may be needed to illicit an adequate immune response) and (2) two doses of vaccine will likely be needed to confer adequate protection. A vaccine requiring two doses and 90 mcg per dose would provide enough vaccine for only 75 million people worldwide, given the current vaccine production capacity (see References: Poland 2006).

Production Capability in Only a Few Countries

Most of the world's influenza vaccine is produced in a few countries. These countries are likely to reserve scarce supplies for their own populations during a pandemic, thus leading to an inequitable distribution of vaccine, particularly to developing countries. This issue has relevance for the United States as well, where current domestic vaccine production falls far short of producing adequate vaccine supplies to vaccinate the entire US population. Moreover, the US plan does not address the issue of distributing vaccine to other countries.

Nine companies, located in the following nine developed countries, currently produce influenza vaccine:

- Australia
- Canada
- France
- Germany
- Italy
- The Netherlands
- Switzerland
- The United Kingdom
- The United States

Technological Challenges to Vaccine Development

The manufacture of vaccines derived from pathogenic avian strains poses a number of technological challenges. For example, highly pathogenic avian strains cannot be grown in large quantities in eggs because they are lethal to chick embryos. These strains also pose significant safety issues and would require extensive biocontainment procedures during the manufacturing process.

Several approaches have been suggested to overcome these issues. One approach, use of reverse genetics, has been used for preparing H5N1 seed strains (see References: Webby 2004; WHO: Development of a vaccine effective against avian influenza H5N1 infection in humans). Reverse genetics provides several advantages in influenza vaccine development (see References: Luke 2006, Palese 2006): (1) it allows creation of engineered viruses that are modified to be less virulent, thus eliminating the need for high-level containment, (2) with reverse genetics, a selection system is not needed to derive appropriate reassortant viruses from background parental viruses,

(3) it dramatically shortens the timeframe for production of seed strains, (4) it allows for standardization of seed strains to be used in vaccine development, and (5) the process may eliminate the potential for any adventitious agents to enter the manufacturing process. Other approaches include the following (see References: Stephenson 2004).

- Produce inactivated vaccine from wild-type virus
- Select an antigenically related but nonpathogenic surrogate vaccine strain
- Use other viruses (eg, baculoviruses, adenoviruses) to express recombinant hemagglutinin
- Develop DNA-based vaccines

It is not yet clear whether new vaccines made from seed strains generated through reverse genetics will be immunogenic in humans, given that candidate vaccines developed against the 1997 H5N1 strain from Hong Kong were poorly immunogenic (see References: Stephenson 2004). It may be that an effective vaccine cannot be developed until a true pandemic strain (reassorted with human influenza viruses) emerges and can be used as the seed virus.

In May 2006, HHS awarded $1 billion to five pharmaceutical companies to develop cell-based technologies for making influenza vaccines. The vaccine manufacturers are GlaxoSmithKline, MedImmune, Novartis Vaccines & Diagnostics, DynPort Vaccine, and Solvay Pharmaceuticals (see May 4, 2006, CIDRAP News story).

Research into new approaches for vaccine production is a high priority because stockpiling prototype vaccines may be worthwhile if protection against emergent strains can be demonstrated (see References: Schwartz 2005). Recent studies using prototype vaccines developed through reverse genetics or recombinant technology suggest that these strategies are promising:

- One study demonstrated good cross-protection against H5N1 in mice following vaccination with an H5 influenza vaccine created through reverse genetics (see References: Lipotov 2005). Protection was achieved despite antigenic differences and incomplete matching between the vaccine strain and the challenge virus. Although these findings are promising, it is not clear if similar protection would occur for humans.
- A second recent study found that an inactivated whole-virus H5N1 vaccine produced through reverse genetics offered protection to ferrets challenged with the vaccine strain and to ferrets challenged with two other H5N1 strains (see References: Govorkova 2006).
- Two additional studies have tested the immunogenicity of recombinant adenovirus-based H5N1 vaccines. One study demonstrated protection against lethal challenge in mice (see References: Hoelscher 2006) and the other demonstrated protection in mice and chickens (see References: Gao 2006).

Another option for consideration is development of influenza vaccines based on cell-mediated immunity. Cell-mediated responses generally focus on internal influenza proteins, which are more conserved and less susceptible to antigenic variation (see References: Thomas 2006).

Appendix C - Current Pandemic Planning

Provides a medical perspective of influenza pandemic.

Excerpts, October 2006 from the website of
Center for Infectious Disease Research & Policy, University of Minnesota
http://www.cidrap.umn.edu/cidrap/content/influenza/panflu/biofacts/panflu.html

Pandemic Preparedness Planning

Although pandemic planning has been ongoing for several years at the global level (through WHO) and in a number of countries, the challenges for preparing for a pandemic are enormous. Even with the best planning efforts, there is no way to adequately prepare for a pandemic given the currently available resources. The challenges include these:

- If an influenza pandemic were to occur in the near future, vaccine for the pandemic strain would not be readily available for many months. Even though some developed countries have stockpiles of antiviral agents effective against influenza, supplies of these agents would be limited and inadequate to cover all of those in high-risk groups (see References: Hayden 2004).
- WHO has developed a protocol for rapid response and containment, which relies heavily on mass prophylaxis in the area where a pandemic strain arises (see References: WHO: Pandemic influenza draft protocol for rapid response and containment). Roche has developed a stockpile of oseltamivir that can be deployed to any area of the world where it is needed; however, the logistical challenges of implementing mass prophylaxis in many areas of the world are enormous and such an effort would be extremely resource intensive.
- Once a vaccine is available, the current plans do not adequately address how the vaccine will be distributed globally. This is of great concern, since vaccine is only produced by a few countries and those countries are likely to not release vaccine until the needs of their populations are met.
- If the next pandemic strain is highly virulent (such as the 1918 strain) the global death toll could be dramatic. The current plans generally do not address the social, political, or economic issues that would likely be associated with an ongoing influenza pandemic (see References: Osterholm 2005: A weapon the world needs; Osterholm 2005: Preparing for the next pandemic [*N Engl J Med*]; Osterholm 2005: Preparing for the next pandemic [*Foreign Aff*]). It is very possible that substantial disruption of basic services (such as healthcare, food, clothing, provision of utilities [eg, water, electricity], and transportation) will occur. Furthermore, international trade will likely be impacted, which could have serious global economic and societal consequences.

To effectively manage a pandemic, additional information is urgently needed in a number of areas (see References: Stohr 2005); if a pandemic occurs soon, we are unlikely to have answers to these complex issues:

- Case management (including hospital surge capacity) and hospital infection control
- Immunogenicity of vaccines for pandemic influenza
- Early interventions to slow the spread of emerging pandemic viruses
- The role of various animal and bird species in the epidemiology of influenza viruses with pandemic potential
- Risk assessment
- Ethical issues related to distribution of scarce resources

General Considerations

Antigenic Drift vs Antigenic Shift

- "Antigenic drift" refers to the process of small genetic changes that influenza viruses continuously undergo from year to year, which necessitates the development of new vaccines annually. Partial immunologic cross-reactivity between new strains and those they are replacing (ie, homosubtypic immunity) limits morbidity, mortality, and spread in the population.
- "Antigenic shift" refers to substantial genetic changes caused by the process of genetic reassortment. Relatively few lineages of influenza A are circulating among humans at any one time, which reduces the likelihood of significant genetic reassortments. However, antigenic shift can occur between human and animal strains, which is what happened with the pandemic strains of 1957 and 1968. It is important to note that not all pandemic strains arise from genetic reassortment. For example, the 1918 pandemic strain apparently did not originate through a reassortment event; rather, it is likely that an avian strain initially infected humans and then adapted gradually to the human population over time to become a pandemic strain (see References: Taubenberger 2005).

Features of Pandemic Strains

Pandemics occur when a novel influenza strain emerges that has the following features:

- Highly pathogenic for humans
- Easily transmitted between humans
- Genetically unique (ie, lack of preexisting immunity in the human population)

Pandemic Phases

In reviewing the public health implications of a pandemic, it is useful to understand the various phases that a pandemic will likely go through. These are outlined in the following table. (Note: In 1999, WHO developed a set of pandemic phases; these were revised in the new WHO Global Influenza Preparedness Plan that was released in April 2005. The phases identified below are from the 2005 Plan [see References: WHO: WHO global influenza preparedness plan 2005].) The current pandemic phase for H5N1 is Phase 3.

Phase 1

Characteristics of Phase: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.

Rationale: It is likely that influenza subtypes that have caused human infection and/or disease will always be present in wild birds or other animal species. Lack of recognized animal or human infections does not mean that no action is needed. Preparedness requires planning and action in advance.

Phase 2

No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.

Rationale: The presence of animal infection caused by a virus of known human pathogenicity may pose a substantial risk to human health and justify public health measures to protect persons at risk.

Pandemic Alert Period

Phase 3

Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.

Rationale: The occurrence of cases of human disease increases the chance that the virus may adapt or reassort to become transmissible from human to human, especially if coinciding with a seasonal outbreak of influenza. Measures are needed to detect and prevent spread of disease. Rare instances of transmission to a close contact, for example, in a household or healthcare setting, may occur but do not alter the main attribute of this phase (ie, that the virus is essentially not transmissible from human to human).

Phase 4

Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.

Rationale: Virus has increased human-to-human transmissibility but is not well adapted to humans and remains highly localized, so that its spread may possibly be delayed or contained.

Phase 5

Larger cluster(s) but human-to-human spread is still localized, suggesting that the virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk).

Rationale: Virus is more adapted to humans and therefore more easily transmissible among humans. It has spread in larger clusters, but spread is localized. This is likely to be the last chance for massive coordinated global intervention, targeted to one or more foci, to delay or contain spread. In view of possible delays in documenting spread of infection during pandemic Phase 4, it is anticipated that there would be a low threshold for progressing to Phase 5.

Pandemic Period

Phase 6

Increased and sustained transmission among general population.

Rationale: Major change in global surveillance and response strategy, since pandemic risk is imminent for all countries. The national response is determined primarily by the disease impact within the country.

From WHO: WHO global influenza preparedness plan 2005 (see References).

Appendix D - Additional Resources

1. www.pandemicflu.gov and www.avianflu.gov - This site is the official U.S. government location for information, including for the CDC. As mentioned on page 7 or this report, state and local contacts are available at www.pandemicflu.gov. Clicking on any state on the U.S. map (under the heading "Where You Live") will produce links to state pandemic planning information and local contacts. Information also includes federal funding allocated to the state for pandemic planning.

2. 10-Point Framework for Pandemic Influenza Business Continuity Planning is a free document available from the Center for Infectious Disease Research and Policy (CIDRAP), University of Minnesota. The plan incorporates the views of 19 industries and may be accessed at the CIDRAP website under Pandemic Flu. You will need to fill out a short registration and the document will then be emailed to your indicated address.

3. Preparedness Templates — A number of useful Business Continuity Forms are available for free from the Institute for Business & Home Safety. The forms may be accessed at: http://www.ibhs.org/business_protection/bus_cont_forms.asp

Of the 13 forms available, the following are recommended for review:

- Employees (for developing Employee Contact List
- Supplier/Vendor Information
- Key Contact
- Business Functions
- Recovery Location

4. A number of government generated checklists are available including the "Business Pandemic Influenza Checklist" developed by the Center for Disease Control and Prevention (CDC). These are accessible at:
http://www.pandemicflu.gov/plan/checklists.html

5. Answers to frequently asked questions are available at the World Health Organization (WHO) website at:
http://www.who.int/csr/disease/avian_influenza/avian_faqs/en/index.html

6. "Ten things you need to know about pandemic influenza" available at the WHO website:
http://www.who.int/csr/disease/influenza/pandemic10things/en/index.html

OTHER WEB-BASED RESOURCES

www.whitehouse.gov/infocus/pandemicflu

www.cidrap.umn.edu/cidrap/content/influenza/panflu/biofacts/panflu.html

www.who.int/csr/disease/avian_influenza

www.oie.int

www.avianinfluenzainfo.com

www.fda.gov

www.usda.gov

Bibliography

Booz, Allen, Hamilton. "Influenza Pandemic Simulation: Implications for the Public and Private Sectors; 2006.

Center for Infectious Disease Research and Policy (CIDRAP). "Pandemic Influenza Business Contingency Planning: Key Assumptions"; University of Minnesota, 2006.

Center for Infectious Disease Research and Policy (CIDRAP). "Pandemic Influenza Business Contingency Planning Issues by Business Sector." University of Minnesota, 2006.

Centers for Disease Control (CDC). "Business Pandemic Influenza Checklist."

IFH Foodservice/Alex Lee. "An Analysis of the Potential Impact of the H5N1 Avian Flu Virus; March, 2005

Society for Foodservice Management. Crisis Management Toolkit: Business Continuity Resource Guide, 2006.

INTERNATIONAL FOODSERVICE DISTRIBUTORS ASSOCIATION
201 Park Washington Court, Falls Church, VA 22046-4521
P: 703/532-9400 F: 703/538-4673 www.ifdaonline.org