Artículo Original

Revista de Investigaciones Universidad del Quindío
ISSN 1794-631X e-ISSN 2500-5782

# MANAGING EBOLA AND COVID-19 CRISES FOR AVIATION INDUSTRY: DID INDUSTRY LEARN HOW TO LEARN?

# GESTIÓN DE LAS CRISIS DE ÉBOLA Y COVID-19 EN LA INDUSTRIA DE LA AVIACIÓN: ¿APRENDIÓ LA INDUSTRIA CÓMO APRENDER?

Aşcı, H.Bahar; Koçak, R.Dilek; Dalmış, Alper B.; Göçmen, F.Didem

**H.Bahar Aşcı** baharasci@gmail.com
University of Turkish Aeronautical Association, Turquía

**R.Dilek Koçak** r.dilekkocak@gmail.com
Ufuk University, Turquía

**Alper B. Dalmış** alperdalmis@hotmail.com
University of Turkish Aeronautical Association, Turquía

**F.Didem Göçmen** didemgocmen@gmail.com
University of Turkish Aeronautical Association, Turquía

**Revista de Investigaciones Universidad del Quindío**
Universidad del Quindío, Colombia
ISSN: 1794-631X
ISSN-e: 2500-5782
Periodicity: Anual
vol. 34, no. 1, 2022
riuq@uniquindio.edu.co

Received: 15 September 2021
Accepted: 11 January 2022

**URL:** http://portal.amelica.org/ameli/journal/517/5173110001/

**DOI:** https://doi.org/10.33975/riuq.vol34n1.762

**Abstract:** Learning is necessary for an organization to evolve, improve and innovate. We are all conditioned to benefit from the evident effects of our behaviors. After the first try, we do not touch the hot stove again. We are also conditioned to recognize complex scenarios and apply fast solutions. Companies are like humans and they also learn as people do. From this point of view, the aviation industry is discussed in this study beyond the learning loops approach of Agrysis which is an effective tool that encourages the kind of thought and action that is needed to transform an organization into a learning one. Turkish Airlines, EasyJet, Delta Airlines, Air China, United Airlines, China Eastern Airlines, China Southern Airlines, American Airlines, Southwest Airlines and Ryanair had chosen as the sample of this study and data collected from the annual reports of these companies was analyzed with document analysis methodology. By comparing the crisis management styles of the industry during Ebola and Covid-19 Diseases the question "did the industry learn how to learn?" tried to be answered and as a result, the study found that the way the industry responded to both crises had not gone too far from single loop learning, or in other words, the industry had only given a reaction to the actions on time and forgot every experience till the next crisis. In the end, the study discussed that single loop learning style of airline companies may be the reason for the rapid spread of those kinds of diseases all over the world.

**Keywords:** Learning Organization, Learning Loops, Ebola Epidemic, Covid-19 Pandemic, Aviation Industry.

**Resumen:** El aprendizaje es necesario para que una organización evolucione, mejore e innove. Todos estamos condicionados para beneficiarnos de los efectos evidentes de nuestros comportamientos. Después del primer intento, no volvemos a tocar la estufa caliente. También estamos condicionados a reconocer escenarios complejos y aplicar soluciones rápidas. Las empresas son como los humanos y también aprenden como lo hace la gente. Desde este punto de vista, la industria de la aviación se analiza en este estudio más allá del enfoque de ciclos de aprendizaje

de Agrysis, que es una herramienta eficaz que fomenta el tipo de pensamiento y acción que se necesita para transformar una organización en una que aprende. Turkish Airlines, EasyJet, Delta Airlines, Air China, United Airlines, China Eastern Airlines, China Southern Airlines, American Airlines, Southwest Airlines y Rynair habían elegido como muestra de este estudio y los datos recogidos de los informes anuales de estas empresas analizados con documento metodología de análisis. Al comparar los estilos de gestión de crisis de la industria durante las enfermedades del Ébola y Covid-19, la pregunta "¿la industria aprendió a aprender?" trató de ser respondido y, como resultado, el estudio encontró que la forma en que la industria respondió a ambas crisis no se había alejado demasiado del aprendizaje de ciclo único, o en otras palabras, la industria solo había reaccionado a las acciones a tiempo y olvidó cada experiencia. hasta la próxima crisis. Al final, el estudio discutió que el estilo de aprendizaje de ciclo único de las compañías aéreas puede ser la razón de la rápida propagación de ese tipo de enfermedades en todo el mundo.

**Palabras clave:** Organización de aprendizaje, circuitos de aprendizaje, epidemia de ébola, pandemia de Covid-19, industria de la aviación.

## INTRODUCTION

In December last year, the outbreak of COVID-19 led to a global health crisis of unprecedented scope. As of November 15, 2020, more than 54 million cases across 188 countries have been confirmed, resulting in the loss of 1.3 million lives. The devastating effect of COVID-19 left an arduous impression that a medical crisis of this magnitude was by no means anticipated or capable of being managed by global health care systems. In addition, through the unjust social impact on economic and physical well-being, systemic systems have revealed their underlying weaknesses. However, the exposure of structural vulnerabilities will illustrate the need for transformative reform to combat and prevent future pandemics. This poses the issue of how the fundamental urgency for transformational change can be facilitated by pandemics. Double-loop learning, in which the basic assumptions, principles and identities of society, institution, or individual are re-evaluated, is an important way of evaluating the degree of change that occurs.

Due to the trends of coincidental development that they have generated in recent decades, the technology change and increased population growth have caused an international concern: the emergence of new infection strains as well as a strong increase in air travel use (Kahn et al. 2013; Smith et al., 2014). The potential for infectious illnesses has emerged from this risky mixture. Due to the worldwide-threatening infectious diseases, policymakers and experts are increasingly devoted to finding a way to avoid the outbreak spread and contain it at their borders. Air transport is regulated and air travelers undergo surveillance and quarantine to deal with infectious disease outbreaks as quickly as possible.

Some of the most important players in the outbreak of infectious diseases are commercial airlines. A growing number of air travelers increases the possibility of the spread of infectious diseases. If passengers or crew members are exposed

during a journey to an infectious or potentially infectious individual, early disease detection and coordinated risk assessment among authorities are required.

In the modern world, there are numerous transport options, and for instant and efficient transport, commercial airlines are the right choice. Airlines become gatekeepers in a global crisis — the quickest way to shuttle emergency personnel, experts, doctors, and other response teams quickly and efficiently to needy areas. Commercial airlines operate in every country in the world with the highest extent of immediate access and the lowest cost of implementation. They also represent the lowest costs for setup as they are eligible to fly into that region of the globe with the required equipment and staff.

Although airlines provide the best way to deal with a crisis immediately, they still come up with their own unique problems. Airlines are globally or privately owned companies and are specialized in such business practices as marketing and profit, aviation and transport. Naturally, they are not connected to the health sector, and healthcare practitioners need specific guidelines and legislation for working safely during infectious disease epidemics. As businesses are interested primarily in profit, they often do not have a moral or ethical interest in continuing to work in countries where epidemics occur unless it is in their own economic interests. Several experts have recognized that banning all flights into countries with an outbreak and limiting the number and capability of emergency personnel to enter the area effectively will only make it easier to proceed with an outbreak and to spread it.

However, as airlines are not solely driven by international morality, they are permitted to impose a flight ban (Chamar, 2014). Regulations in the aviation sector are often required to direct them in areas where flight bans could be a choice given the type and magnitude of the epidemic and where an epidemic ban has been imposed so that flights can be re-established safely.

In this perspective, an outbreak of pandemics that resulted from coronaviruses in China at the end of December 2019 has been the most widespread and dreadful one that humanity has faced after the bacteria-led diseases such as typhus and cholera. It is known as a new type of coronavirus that is part of a large family of viruses. It is called "a novel coronavirus (COVID-19) which is a new strain that has not been previously identified in humans" (ECDC, 2020).

The aim of this study is to address the question of whether the aviation companies' learning style is a single loop or double loop by comparing the behavior they took during the Ebola epidemic and Covid-19 pandemic diseases and taking all these explanations into account. The aviation sector, in the opinion of Senge in its study on learning organizations, can be seen as the biggest sector in the spread of this kind of disease, and the lessons learned from experience are so important for the whole world.

The narrative literature review method was selected as the research method for this paper. So, the purpose of this narrative review paper is to succinctly review the coronavirus from a business perspective and shed light on its evolution.

## THEORETICAL BACKGROUND

### *The Overview of Ebola Epidemic Disease*

The Ebola virus epidemic is one of the most dangerous conditions for humanity due to a high death rate (up to 90%). "Ebola haemorrhagic fever (EHF) is an infectious animal illness that can be spread to both human and non-human primates" (Rajak, Jain, Singh, Sharma and Dixit, 2015: 337). Since the 1970s, there have been numerous Ebola transmitting incidents and more than 20 Ebola outbreaks (Kalra, et. al., 2014:164). But the first EHF outbreak took place in the Democratic Republic of the Congo in 1976.

The incubation time for Ebola Virus Fever is 2 to 21 days, with most outbreaks happening during the first 10 days (Brown and Johnson, 2018:3). The virus was first recognized in humans and was affiliated with two distinct viruses, the Sudan ebolavirus (in Sudan) and the Zaire ebolavirus (in Zaire), and crossed the area of Yambuku, Zaire, which contributed to its name (Pacheco, Rodrigues and Silvia, 2015:459). Since it was discovered by Dr Peter Piotin in Zaire in 1976, in the blood of a Catholic Nun suspected of yellow fever in Africa (now the Democratic Republic of Congo), Ebola viruses (EVD) have always been a concern and a global threat. EBOLA haemorrhagic fever (EHF) (Rajak, Jain, Singh, Sharma and Dixit, 2015: 337) means the zoonotic condition, that unintentionally spreads through direct contact with living and dead infected animals.

In August 2014, the world's largest, most sustained and broadest epidemic of Ebola was declared an International Public Health Emergency (PHEIC) by the World Health Organization (WHO). The World Health Organization was initially advised of the epidemic after the febrile diseasing cluster associated with high fatalities in the Gueckedou area of Guinea, which attracted international attention in March 2014.

It is spread by direct contact with contaminated bodily fluids after joining the human population (blood, faeces, saliva, semen), and reaches the body of the next person by contact with mucous membranes or breaks in the skin (Brown and Johnson, 2018:3). Social mobilization and community involvement are at the root of the Ebola outbreak response (Brown and Johnson, 2018:4). As Ebola has spread beyond West Africa, it is imperative that infection is contained faithfully in all affected areas.

### *The Overview of Covid-19 Pandemic Disease*

As expressed, there has been an increase in the frequency of emerging pandemic diseases at our age. Globalization, fast economic development, population increase, pollution, deforestation of farming area, land degradation for urbanization, decreasing wildlife for animals, all together, have a certain share of the outbreak of virus-originated diseases which is hardly incurable. It is believed that the factors that created a suitable environment for infectious disease emerged in the last decade of the twentieth century. Notably, the increased speed and volume of international trade and travel, i.e., globalization, were

considered major factors in spreading infectious diseases (Fidler, 2004: 14). In near history, the HIV/AIDS pandemic disease presented a great problem for the twentieth-century public health organization. According to a figure until the end of 2018, "32 million people died from AIDS-related illnesses since the start of the epidemic" (UNAIDS, 2019; Fidler, 2004: 14-15).

The fast economic development in China in the last 40 years has had a huge side effect on the environment, nature and wildlife. The major factor affecting the evolution of Covid-19 is the decreasing wildlife for animals. According to scientists, animal-like bats, snakes, or mosquitos, to adapt to new life patterns, have undergone some mutations. When they are subject to a mutation, they can create some viruses that can be transmittable to humans. In fact, the outbreak of Covid-19 has emerged out of so-called the evolution of animals. However, the outbreak of Covid-19 has not happened at once. It has an epidemic that has had roots in the past.

Except for the AIDS pandemic disease, there have not been any pandemic diseases that affected the entire globe as such, since the outbreak of the Black Death in 14th century. The Black Death originated in China but was transmitted to Europe through the Silk Road trade. The interesting point here is that the current epidemic event also originated in China and was transmitted to the World. This overlapping phenomenon can lead to interesting results. Both pandemic diseases have proven that no border can prevent the spread of the pandemic to other states, countries, or continents. The second similarity is that there is no specific treatment for both pandemic incidents. No golden treatment or cure methods have been identified for both diseases. The following will explain the evolution of Covid-19 disease.

Many researchers have studied the outbreak of epidemic diseases. According to them in the past – a new pathogenic microbe has appeared in humans, travelled through international trade and travelled to other countries, triggered cultural, political, and social instabilities and has also caused the death of people because of uncovered shortcomings or inexistence of public health capacities (Fidler, 2004: 13).

A virus hit mankind in 2003 with a vengeance that appeared apocalyptic. This disease originated in China, but quickly crossed borders in a matter of hours around the world. Its spreading rate left the doctors and researchers behind in the wake of the attack, fighting to create physical and intellectual walls. Doctors and researchers' emotions, though, were nothing compared to the terror of the world's nations when they abruptly met with a new, unknown and mysterious adversary which killed one in five people (Lee, 2014:1).

Due to the pandemic and infectious characteristics of the virus, a feeling of fear among people emerged. Thousands of people around the globe were quarantined. Many of them chose to stay at home, rather than risking meeting a co-worker or an outsider. The tourism industry was almost at a standstill. Airlines, malls, bars, hotels and other companies underwent huge losses. The virus also caused the death of people (Lee, 2014:1).

The virus was everywhere for a frenetic couple of months. Though not visibly present, the name was published on television screens and covertly in newspapers daily: "Severe Acute Respiratory Syndrome," much better known by the acronym "SARS" (Lee, 2014: 1). "SARS equalled fear. SARS equalled the unknown. SARS

equalled the uncontrollable. SARS equalled death" (Lee, 2014:1). SARS disease, which was alarmed by the WHO in February 2003, affected countries such as Hong Kong, Taiwan, Canada, and Singapore, long after China's Guandong region (Toraks, 2011). The enemy was a new coronavirus with a distinct antigenic and genomic structure. Coronaviruses are single-stranded RNA viruses that cause upper respiratory infections and enterocolitis in both animals and humans (Toraks, 2011). Rapid intervention "by national and international health authorities like the WHO helped delay transmission and ultimately broke the transmission chain" (Lacroix, 2012:14).

After the advent of SARS-CoV, the Mid-2012 emergence of MERS-CoV proved the "prophecy" that a CoV epidemic is still "around the corner." MERS-CoV is SARS-CoV's "near cousin." But unlike SARS-CoV, which was controlled within one year of emergence, there appear to be reports of MERS-CoV (Vijay, 2020: v).

Coronavirus is a large family of viruses that cause diseases from the common cold to more extreme conditions, for example, "Middle East Respiratory Syndrome (MERS-CoV)" or "Extreme Acute Respiratory Syndrome (SARS-CoV)". A "novel coronavirus (nCoV)" is a new strain not previously discovered in humans (WHO, 2020).

"Middle East respiratory syndrome coronavirus (MERS-CoV) is widespread in bats and in dromedary camels and can be zoonotically transmitted from camels to humans (Qing, Hantak, Galpalli, Gallagher, 2020: 9). The virus was discovered in humans in 2012 and more than 2,000 laboratory-confirmed cases have occurred worldwide since then with fatal effects reported by 35% of infected humans. While MERS-CoV levels of zoonotic and human-to-human transmission have decreased due to the general knowledge and improved medical procedures, there are ongoing epidemic possibilities, and preventive vaccinations and therapeutic antivirals are needed. The development of vaccines and antivirals (Qing et al. 2020) will be encouraged by mechanistic research into the application of human MERS-CoV.

"Respiratory symptoms, fever, cough, shortness of breath and breathing difficulty" are typical indicators of infection. In more serious cases, pneumonia, extreme acute respiratory syndrome, renal failure or even death may contribute to infection" (WHO, 2020). MERS-CoV and SARS-CoV, the emerging coronaviruses may lead to substantial morbidity of the disease and mortality among infected people. A common clinical feature contributing to the degree of disease and viral transmission is lung infection (Meyerholz and Beck, 2020: 205).

All in all, coronavirus has been called "SARS-CoV-2", while the illness it caused is named "Covid-19". It can affect both animals and humans and can cause respiratory tract diseases. According to scientists, animals that had been infected may have first spread the virus to people in Wuhan, where live fish and bats were sold (NYT,2020).

In addition, the lethality of a new virus is difficult to assess exactly when it refers to the death rate. This is less devastating than coronaviruses which caused "SARS or MERS" but are much more lethal than seasonal influenza. It is calculated that the mortality rate is approximately 2%. This event is almost the same as in intense grip seasons (NYT, 2020). Although the death rate is not bigger than severe flu, the influence of the Covid-19 is larger than any other SARS

or MERS-originated disease. The major point here is that the spreading rate of the Covid-19 is faster than any known virus-originated illnesses.

*Airlines and Pandemic Diseases*

Airlines face several pressures in a public health emergency. At the turn of the 21st century, the African aviation sector gained traction through enhanced connectivity and the Ebola outbreak showed that the public health emergency response policy of air transport worked.

One of the most important players is international carriers during an epidemic of infectious disease. Although in the modern-day world there is a multitude of transport choices, commercial airlines offer the best choice for instant and reliable transport. Airlines become the gatekeepers in a global epidemic — the best way to shuttle health workers, specialists, physicians and other response teams to the appropriate zones quickly and efficiently (Ferrell and Agarwal, 2018: 1-2).

A two-year-old boy in the remote Guinean village of Meliandou became ill with a mysterious disease characterized by fever, black stools and vomiting on 26 December 2013. Two days later, he died. WHO's retrospective case-finding would later identify the boy as West Africa's first case of Ebola virus disease (WHO, 2020).

The West Africa EVD Outbreak 2014-2015 showed a range of important and cross-cutting issues that are key to a comprehensive response to Ebola (Brown and Johnson, 2018:5).

The major sectors influenced by an outbreak are aviation, tourism, and travel sectors. Coronavirus has created major disruptions on many continents in the aviation industry and airlines. Because of fear customers hesitate to use air ways if coronavirus is a threat. As countries have suspended their international flights to affected countries, some regional airline companies are encountering disruption and eventually bankruptcy.

*Learning Types and Aviation Industry as a Learning Organization*

One of the main principles of literature and activity management at the turn of the century is the organization of learning. It is not just a standard theoretical philosophy (Senge, 1990a; Garvin, 1993), but it has also become a new concept in management practice. As Bill O'Brian, CEO of Hanover Insurance, said, "the old dogma of planning, arranging and managing must be discarded .... To give way to a new dogma of vision, principles and conceptual templates "(Senge, 1990a:299).

Two independent variables have reinforced the new paradigm:

The need for constant improvement because of the constantly shifting demands of consumers, technical advancement and fierce rivalry between industry members.

• With top-level inspiration and technical preparedness, people join the field of work. Chris Argyris researched how people's personal development, i.e., their development from adolescence to adulthood, was shaped by the sort of circumstances they encountered at work. Many work conditions encourage

individuals to flourish while others stunt their development (Argyris, 1957, 1962, 1974, 1985). In all facets of life, people are committed to the continuous improvement of everything they do (Senge, 1990a). This means the practice of personal growth and learning." The conception of flow, the mental condition in which people are completely absorbed in what they are doing, is created (Csikszentmihâlyi, 1995; 1996; 2003) through a sense of energy, complete participation and achievement.

The modern empowerment model (Argyris, 1998) and the priority of macro-leadership positions responsible for identifying the need for improvement, designing plans for change and aligning people with change (Kotter, 1990) address the challenge of both the environment and the (motivational) person.

Peter Senge makes it clear that special leadership competencies are needed for building learning organizations (Senge, 1990a). Personal learning is one of the core competencies, among others.

Chris Argyris has established the theory of learning, which separates single- and double-loop learning. Whenever a mistake is noted and corrected without altering or questioning the fundamental framework concepts (individual, community, intergroup, organizing or inter-organizational), learning is a one-on-one method (Argyris and Schon, 1978:8). When errors are connected, double-loop occurs.

From the point of view of change management, the "single-loop" and "double-loop" learning models can also be interpreted as follows; it was Paul Watzlawick and his academic team (Watzlawick, Fisch and Weakland, 1974) who developed the principle of first-order and second-order change: ". There are two distinct forms of change: one that happens within a system that stays untouched on its own, and one that affects the system itself. .... Shift in the second order is also the shift of change (Watzlawick et al., 1974:10-11).

One of the problem-solving processes is single-loop learning. Typically, individuals analyze the environment, compare data with the norm, and then initiate suitable intervention. Individuals look at what choices they must address in the issue. They respond internally or externally to changes by finding how to adjust errors to retain the organizational standard's characteristics. This is single loop learning that happens when mistakes or concerns are found and resolved, and companies continue to follow their strategies and objectives. Activities to correct mistakes and solve problems contribute to the knowledge base or company-specific skills or habits without altering the basic essence of the activities of the organization (Argyris, 1977;1991).

Double-loop learning, however, is a method to compare the situation with the standard, challenge whether the standard is acceptable and explain whether this is the right way to do things. To, possibly, create a new set of criteria, the existing organizational criteria will be challenged. The organization is interested in questioning and changing the underlying principles, practices, strategies, and priorities of an organization. Changing the knowledge base or firm-specific skills or habits is part of the process (Argyris, 1977;1991). Double loop learning has been shown to be quite fitting for the present turbulence and invariable environmental change to be pursued (Senge, 1994).

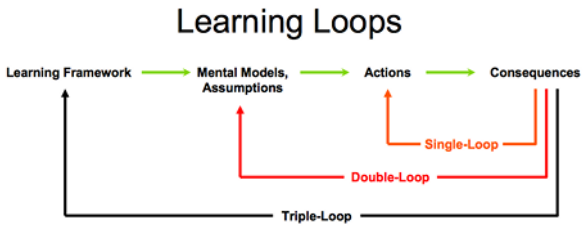


Fig 1: Models of organizational learning
Eilertsen, Soren. Models of organizational learning. Kollner group, Inc. USA, p.32.

Triple-loop learning is another preferred method of integrating and going beyond single- and double-loop learning. While one-loop learning poses questions about behavior, and double-loop learning poses questions about underlying mental models and attitudes, triple-loop learning aims to transform the participants in an organization by helping them understand how to learn. In other words, three-loop learning aims to develop an ability to make effective use of one- and two-loop teaching.

Triple-loop learning challenges a person's current learning framework, and mental models and assumptions. Ideally, triple-loop learning combines all local units of learning into a single learning organization. Members of the organization learn how to make use of the embedded various components of the mutual knowledge of the organization in carrying out this mission.

## *RESEARCH METHODOLOGY*

### *Research Context: Ebola Versus Covid-19 in Aviation Sector*

In this study aviation sector was chosen to see whether the sector's learning style was a single loop or double loop and to explain this, the Ebola epidemic and Covid-19 pandemic diseases were chosen. The actions were taken by the aviation companies, especially airline companies. were compared with each other, which are the first 10 companies of the year 2019, according to the ICAO statistics.

These companies are listed below and for this study, the total passengers they carried was counted for comparison.

Tab.1: Scheduled Passengers Carried

Scheduled Passengers Carried (Total)

| Rank | Airline | Thousands |
|---|---|---|
| 1 | Southwest Airlines | 163.606 |
| 2 | DeltaAirlines | 152.217 |
| 3 | American Airlines | 148.181 |
| 4 | Ryanair | 136.718 |
| 5 | United Airlines | 113.215 |
| 6 | China Southern Airlines | 103.975 |
| 7 | China Eastern Airlines | 95.618 |
| 8 | EasyJet Airlines | 88.089 |
| 9 | Turkish Airlines | 73.201 |
| 10 | Air China | 71.001 |

World Air Transport Statistics 2019 Edition (https://www.iata.org/contentassets/a686ff624550453e8bf0c9b3f7f0ab26/wats-2019-mediakit.pdf.)

*Data Sources*

The account was developed to examine the effects by relying on archival records and publicly accessible data. Archival sources such as corporate newspapers, national and local newspapers, and industry websites were used.

Reports and press releases from airlines, the WHO, the International Air Transport Association (IATA), the United Kingdom Civil Aviation Authority, the International Civil Aviation Agency, the World Bank, the US Center for Disease Control and Prevention, and governments were also included in the archival documents.

In exploring the responses of organizations to such disturbances, the archival approach was found to be especially successful.

These data sources have contributed to the discovery of systems, trends and reaction dynamics met with interruptions. On that basis, the airlines responded to Ebola and Covid-19.

*Findings Airline Companies' Applications in Ebola and Covid-19 Outbreaks*

All airline companies included in the sample of the study stopped their flights to West Africa, especially to Sierra Leone, Guinea and Liberia, in 2014. American airlines in the sample have implemented the measures specified by the US Center for Disease Control and Prevention (CDC). The methods specified by the CDC working with the World Health Organization (WHO) and implemented by airlines are as follows:

The person who shows any symptoms of illness is first asked whether she/he has been to the countries where the Ebola Virus is present. Then the symptoms of Ebola are observed or asked respectively. These symptoms include fever, severe headache, myalgia, abdominal pain or unexplained bleeding. If these symptoms appear in the passenger, the passenger should be isolated on the plane. Since

the Ebola virus is transmitted by bodily fluids, in such a situation, the air cabin crew must take care of the passenger with waterproof gloves and masks, and they must give the passenger waterproof mask and gloves. Since the Ebola virus is not transmitted by air, it is very difficult to infect cabin crew if they are careful. If a sick passenger is encountered, the cleaning team is informed of the situation and the plane is cleaned thoroughly after all passengers have landed. In addition, if a sick person is detected while the aircraft is on the way, the pilot must inform the CDC.

China moved quickly to prevent the spread of Ebola disease, strengthening its airfield monitoring and screening systems. In addition, it gave trainings on what to do when a case was encountered by informing airline companies and their employees on technical issues.

EasyJet stopped its flights to West Africa in 2014 and took isolation measures for people with symptoms of illness.

For Turkish Airlines (THY), the Ministry of Health implemented the "Ebola Disease Procedure". Accordingly, the cabin crew was expected to observe signs of illness such as high fever, nausea, and vomiting. The passenger suspected of illness was immediately intervened and with the first announcement on the plane, the passengers were requested to read the Ebola information text prepared by the directorate and included in THY's corporate magazine.

The same companies had to take different measures than the practices in the Ebola epidemic in the face of the epidemic that started to spread around the world at the end of 2019. At this point, the structural differences between the two viruses and the difference in the rate of spread from person to person also affected the nature of the measures.

For example, The Ministry of Health, Republic of Turkey required all passengers with foreign identities to take a HES code. To reduce the contact rate of passengers at the airport, it was suggested that check-in transactions be made online via mobile applications or websites, and the use of masks was made mandatory after entering the airport. Disinfectants were placed at the transition points at the airport and the temperature of the passengers was measured before the flight. Later, this practice was replaced by thermal cameras.

Tables, seat armrests, belts, screens, controls, overhead cabinets, air outlets, reading lights, side panels, windows, washbasins, partitions, magazine racks, decorative panels, cabinets, covering all contact points, are detailed by special teams after each flight and are somehow disinfected. In addition, when the planes return to the center, they have disinfected again by spraying, which is a special two-stage disinfection process, and they are prepared for the next flight.

There are HEPA (High-Efficiency Particulate Air Filter) filters in aircraft; It is a special filtration system that can remove 99.97% of all particles in the air up to 0.3 microns from the air. During flights, the air in the cabin is constantly cleaned with HEPA filters used by hospital standards. With this system, the air is completely renewed periodically every 3 minutes.

In compliance with a defined schedule aimed at maintaining a clean cabin climate, Southwest Airlines has maintained flights. More than six hours are spent between flights cleaning each aircraft. Overnight cleaning procedures have been established as of March 4, 2020.

Typically, an EPA approved, hospital-grade disinfectant is used in toilets and an interior cleaner in the cabin. The use of hospital-grade disinfectants is widely used throughout the aircraft. These procedures have been developed in accordance with the recommendations of the Center for Disease Control and Prevention (CDC) and the World Health Organization (WHO).

Aircraft is fitted with a specialized air distribution system that supplies the cabin with HEPA-filtered air every second throughout the flight and allows the cabin air to be fully adjusted every two to three minutes. The "HEPA (High-Quality Particulate Air)" filter is used like the technology found in hospitals, which eliminates 99.97 percent of airborne particles.

Delta Airlines aims to maintain social distance by reducing the capacity of aircraft, preventing passengers from sitting side by side. In this way, the number of people traveling is limited. Methods are used to reduce the contact in catering during the flight. For example, food services are severely restricted. Instead, passengers are recommended to bring their own meals. In addition, the services of personal items such as blankets, water and handkerchiefs have been severely restricted.

Check-in transactions are done online or via kiosks without contact. It is mandatory to wear a TSA approved protective mask from the entrance to the airport until the end of the journey including passport control, security control, boarding, etc. It is mandatory to comply with the social distance rules at every point. By putting disinfectants at the transition points, personal hygiene is assisted.

Cleaning procedures are carried out before and during each flight, and a continuous cleaning activity is carried out, especially at points such as the washbasins that are common areas during the flight. Thanks to the HEPA filters installed in all aircraft, the air inside the aircraft is renewed every few minutes.

At American Airlines, the use of face masks is mandatory on every journey from the entrance to the airport until the end of the journey. Food and beverage services are limited to prevent contact. Check-in operations are carried out with the help of kiosks or online. In addition, check-in kiosks are cleaned regularly.

Measures are taken at check-in and security control points to comply with the social distance rule. The social distance rule is followed in lounge services and payment and transition transactions are made without contact. Hand sanitizers are available at all transit points and aircraft at the airport.

Accreditation has been obtained from the Global Biorisk Advisory Council that all measures have been taken against Covid-19. By using HEPA air filters in all aircraft, the air in the aircraft is exchanged regularly.

At United Airlines, check-in operations are made online or through kiosks. It is mandatory to use a mask from the entrance to the airport until the end of the journey. Measures are taken during security control and entry to comply with social distance. After each journey, the entire aircraft is cleaned, especially the common areas. Hand sanitizers are available at the crossing points and aircraft, and passengers can sit at a social distance.

Many of its procedures have been raised by Ryanair beyond the protocols required by the authorities. With all aircraft inside being processed with a hospital-grade disinfectant, Ryanair enhanced overnight cleaning. The fleet is fitted with high-performance HEPA (High-Performance Particulate Arrestors)

filters that remove airborne particles down to the size of microscopic bacteria and virus clusters (more than 99.99 percent efficiency).

China Southern Airlines has taken a range of steps to protect passengers' welfare. In addition, there are a variety of precautions that must be taken by travelers. The body temperature of all workers and passengers shall be measured prior to flight. Food, drinks, blankets, etc. are limited to reduce interaction between passengers and between the passenger and the crew. During the flight, the widely used areas are periodically cleaned by the crew. HEPA filters that eliminate 99.9 percent of airborne contaminants are used in all aircraft. After each flight, a thorough cleaning is carried out on the aircraft.

Both passengers and crew must wear masks. Online check-in procedures are required to reduce the time spent at the airport. Lounge facilities are limited to the reduction of touch. Fever measurements of passengers are made prior to the flight. HEPA air filtration systems are used for all aircraft. Detailed cleaning shall be carried out on the aircraft prior to all flights.

Within the framework of coronavirus measurements, the temperature of the body of all passengers and crew is periodically tested. Both passengers and crew are expected to wear masks inside and during travel. In addition, hand sanitizers were installed at the crossing points. HEPA filter systems that provide a high level of protection and remove airborne particles are used in aircraft. Food and beverage facilities are limited to minimize contact between passengers. The aircraft will be cleaned in detail after each flight.

EasyJet uses HEPA filters in all aircraft, implementing safety procedures in compliance with the WHO Guide. In addition, all passengers and crew are expected to wear masks when traveling. After each flight, all aircraft are thoroughly washed. Thanks to this cleaning, at least 24 hours of surface protection are recorded to be obtained in aircraft. The goal is to prevent unwanted interaction by promoting the online check-in process. Services during the flight are limited to minimize contact.

## DISCUSSION

### *The Way Ahead Toward a Need of Globalized Effort for Aviation Industry*

Similar measures taken in both crises are explained above. However, since the aim of the study is to compare learning models, it will be useful to look at how much the flights are affected by the crises in both pandemics.

Table 2. Comparison of Passengers Carried by the Companies in Ebola and Covid-19 Pandemics

| YEAR COMPANIES | 2013 | 2014 | 2019 | 2020 |
|---|---|---|---|---|
| THY | 48.270.005 | 54.674.967 | 35.112.611 | 14.611.794 |
| | +13,3% change | | -58,4% change | |
| EasyJet Airlines | 60.800.000 | 64.800.000 | 96.100.000 | 48.000.000 |
| | +6,6% change | | -50% change | |
| Delta Airlines | 164.659.644 | 171.350.030 | 204.000.000 | 14.280.000 |
| | | | -93% change | |
| Air China Airlines | 77.676.86 | 83.009.610 | 115.006.120 | 808.750 |
| | +6,87% change | | -52,15% change | |
| United Airlines | 91.329.000 | 91.475.000 | 162.443.000 | 42.911.000 |
| | | | -64,9% change (First 9 month of 2019) | |
| China Eastern Airlines | 79.093.680 | 83.811.480 | 130.297.360 | 25.736.850 |
| | +5,96% change | | -59,83% change | |
| China Southern Airlines | 91.790.970 | 100.919.020 | 128.706.500 | 33.724.170 |
| | +9,94% change | | -53,66% change | |
| American Airlines | 193.739.825 | 197.340.801 | 215.182.000 | 50.573.000 |
| | | | -52% change | |
| Southwest Airlines | 133.155.030 | 135.767.188 | 162.681.000 | NA |
| Ryanair | 79.300.000 | 81.700.000 | 152.400.000 | 79.900.000 |
| | +3% change | | -47% change | |

Data collected from the annual reports of THY, EasyJet, Delta Airlines, Air China Airlines, United Airlines, China Eastern Airlines, China Southern Airlines, American Airlines, Southwest Airlines and Rynair and the table is generated by the authors.

From the table below we can see that the Ebola Epidemic did not affect all over the world, and that is why, from 2013 to 2014, the number of passengers carried by the sample companies did not decrease. The actions taken rapidly, especially in Africa were the main reason for this situation, but the picture is not the same for the Covid-19 Pandemic. Because the spread rate of this virus from person to person is not the same as the Ebola virus, the actions taken for this pandemic were more serious than the actions taken for Ebola. That is why, there is a significant decrease in the number of passengers carried by the firms, which fell from 2019 to 2020's almost the third semester.

## CONCLUSIONS

Despite the stressful changes in situations, the airline industry has acknowledged that organizational learning can provide a unique opportunity for versatility in handling crises. Before and after an acute situation, the learning theory can be applied; if the organization applies the lesson learned from past crises or learns from the external uncertainties created by crisis situations (Simmons, 2009), or treats learning as an emerging concept whose history is an integral component of understanding (Gilpin and Murphy, 2008). Using this technique helps airlines to create new information in areas that are relevant to their organizational objectives. In addition, airlines that can stimulate learning can handle more complex problems and build innovative solutions. For this

purpose, organizational learning and a coherent communication approach need to be customized for airline firms to avoid continuing the negative impact on the trustworthiness and authenticity of multinationals and stakeholders. The literature demonstrates that airlines' knowledge and learning assistance is boundless as it ensures stronger and more effective reactions to a complicated and impressive world (Allen et al., 2002).

An outbreak of pandemic which resulted from coronaviruses in China at the end of December 2019 has been the most widespread and dreadful one that humanity has faced, as we said before. It is known as a new type of Coronavirus that is part of a large family of viruses, called a novel coronavirus (Covid-19); "An infected animal may have transmitted the virus to humans at a market selling live fish, animals, and birds in Wuhan City" (NYT, 2020). It has two main specifications: rapid spreadability and causing the death of human beings in a very short time. Of course, there can be several triggering factors to make pandemic diseases widespread around the globe. Globalization, fast economic development, and decreasing wildlife for animals, all together, have a certain share in the outbreak of this virus, which is hardly incurable.

Although there were many epidemic diseases in the past, Ebola, another epidemic discussed in this study, is an epidemic with a strong spread, although not as much as Covid-19. This study showed that the single loop learning experience in Ebola did not change for the aviation industry during the Covid-19 outbreak. While the aviation sector, which connects the whole world, plays a dominant role in the spread of such epidemics, the sector's inability to learn lessons from its past directly affects human health.

Moreover, inside the organizations and the pandemics, both case studies did not find a direct link to double-loop learning. This does not mean that it is not possible to accept pandemics as a landscape shock that speeds up reflexive learning. Neither Ebola nor the other pandemics have had the global disruptive impact on socio-technical structures that COVID-19 is currently having. In comparison to COVID-19, in most cases worldwide, the Ebola virus did not cause illness that warranted hospitalization. The severity and effect of the pandemic may therefore be a deciding factor in triggering double-loop learning within knowledge-based organizations.

Finally, every airline company may use "single-loop" and "double-loop" training. Aviation companies will degrade "double-loop" anomalies to "single-loop" conditions as "single-loop" conflicts are easier to manipulate. For normal practice, "single-loop learning" can be adequate, repetitive glitches that allow us to perform our daily tasks, while double-loop learning" works well in sophisticated conditions such as pandemic diseases.

## REFERENCES

Allen, W., Kilvington, M., & Horn, C. (2002). Using Participatory and Learning-Based Approaches for Environmental Management to Help Achieve Constructive Behaviour Change (pp. 1-51, Rep.). (2002). Lincoln, New Zealand: Landcare Research.

Argyris, C. (1957). Personality and organizations, the conflict between system and the individual. New York: HarperCollins.

Argyris, C. (1962). Interpersonal competence and organizational effectiveness. Homewood: Irwin-Dorsey Press.

Argyris, C. (1974). Personality vs. organization. Organizational Dynamics, 3 (2), 3-17.

Argyris, C. (1985). Strategy change and defence routines. Boston, MA: Inc. Boston: Pitman Publishing.

Argyris, C. (1998). Empowerment: The Emperor's New Clothes. Harvard Business Review, 76 (3), 98-105.

Argyris, C. (2002). Double-loop learning, teaching and research. Academy of Management Learning and Education, 1 (2), 206-218.

Argyris, C., & Schon, D. A. (1978). Organizational Learning: A Theory Of Action Perspective. Reading: Addison-Wesley.

Bloom, David E., Cadarette, D., Sevilla J.P. (2018). New and Resurgent Infectious Diseases Can Have Far-Reaching Economic Repercussions, Finance & Development, 55(2),46-49.

Brown, C. & Johnson, O. (2018). Introduction to Viral Haemorrhagic Fevers. In Ebola Virus Disease A Manual for EVD Management (Ed) Lado, M., Springer.

Chamary, JV. (2014). Ebola Is Coming. A Travel Ban Won't Stop Outbreaks. Forbes, October 13, 2014. http://www.forbes.com/sites/jvchamary/2014/10/13/ebola-travel/#d1db0242e1b6.

Chelsea F. & Pulkit A. (2018). Flight bans and the Ebola crisis. Harvard Public Health Review. 1-14.

Chen, Y., Liu, Q. and Guo, D. (2020). Emerging Coronaviruses: Genome Structure, Replication, and pathogenesis, J Med Virol.; No. 92, 418–423.

Craven, M., Liu, L., Mysore, M. & Wilson, M. (2020). Open interactive popup COVID-19: Implications for business, Accessed: 12 March 2020.https://www.mckinsey.com/business-functions/risk/our-insights/covid-19-implications-for-business,

Csfkszentmihâlyi, M. (2003). Good Business: Leadership, Flow and the Making of Meaning. New York: Penguin Books.

Cslkszentmihâlyi, M. (1995). Finding Flow: The Psychology of Engagement with Everyday Life. New York: Basic Books.

Cslkszentmihâlyi, M. (1996). Creativity: Flow and the Psychology of Discovery and Invention. New York: Harper Perennial.

ECDC. (2020). COVID-19, Access: 15 March 2020. https://www.ecdc.europa.eu/en/novel-coronavirus-china,

Eilertsen, S. (2019). Models of Organizational Learning. Kollner Group, Inc. USA

Fidler, P. David. (2004). SARS, Governance and the Globalization of Disease, Palgrave Macmillan, ISBN 1–4039–3326–X.

Garvin, D. A. (1993). Building a Learning Organization. Harvard Business Review, 7 (4), 78-91.

Kalra, S., Kelkar, D., Galwankar, S. C., Papadimos, T. J., Stawicki, S. P., Arquilla, B., Hoey, B.A., Sharpe, R.P., Sabol, D., Jahre J.A. (2014). The Emergence of Ebola as a Global Health Security Threat: From 'Lessons Learned' to Coordinated Multilateral Containment Efforts, Journal of Global Infectious Diseases / Oct-Dec 2014 / Vol-6 / Issue-4, 164-177.

Khan, K., Eckhardt, R., Brownstein, J. S., Naqvi, R., Hu, W., Kossowsky, D., ... & Cetron, M. S. (2013). Entry and exit screening of airline travellers during the A

(H1N1) 2009 pandemic: a retrospective evaluation. Bulletin of the World Health Organization, 91, 368-376..

Kotter, J. P. (1990). What Leaders Really Do. Retrieved March 18, 2009, from Catalogo de Cursos: http://fs.ncaa.org/Docs/DIII/What%20Leaders%20Really%20Do.pdf

Lacroix, V. (2012). All about pandemics (Epidemic of Infectious Disease), Firsth Edition, University Publications, ISBN 978-81-323-3706-5

Lee, J. D. (2014). An Epidemic of Rumors How Stories Shape Our Perceptions of Disease, University Press of Colorado; ISBN: 978-0-87421-929-6 (e-book).

Louie, D. (2020). Coronavirus: Thousands Of Silicon Valley Employees Work From Home Amid COVID-19 Fears, 13 March 2020, Accessed: 14 March 2020. https://abc7news.com/working-from-home-coronavirus-bay-area-silicon-valley-tech-companies/6007957/

Meyerholz, D. K. & Beck, A. P. (2020). Histopathologic Evaluation and Scoring of Viral Lung Infection. In: MERS Coronavirus Methods and Protocols (205-220), Rahul Vijay (ed.), Humana Press: Iowa City, IA, USA: ISBN 978-1-0716-0211-9.

NYT. (2020). The Coronavirus: What Scientists Have Learned So Far, Access: 14 March 2020. https://www.nytimes.com/article/what-is-coronavirus.html

Pacheco, D., Rodrigues, A. Silva, C. (2015). Ebola Virus- From Neglected Threat To Global Emergency State. Revista da Associação Médica Brasileira, Sep-Oct 2016;62 (5):458-67. DOI: 10.1590/1806-9282.62.05.458. https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-42302016000500458

Parag, K. (2019). Covid-19 Is Traveling Along the New Silk Road. Accessed: 10 March 2020. https://www.wired.com/story/covid-19-is-traveling-along-the-new-silk-road

Qing, E., Hantak, M. P., Galpalli, G. G. and Gallagher, T. (2020). Evaluating MERS-CoV Entry Pathways, In: MERS Coronavirus Methods and Protocols (9-20) Rahul Vijay (ed.), Humana Press: Iowa City, IA, USA: ISBN 978-1-0716-0211-9

Rajak, H., Jain, D. K., Singh, A., Sharma, A.K., Dixit, A. (2015). Ebola Virus Disease: Past, Present and Future. /Asian Pac J Trop Biomed 2015; 5(5): 337-343

Senge, P. (1990). The Fifth Discipline: The Art and Practice of the Learning Organization. New York: Doubelday.

Sidley (2020). Diagnosing and Treating Coronavirus Risks in M&A Transactions, Access: 06 March 2020). https://www.sidley.com/en/insights/newsupdates/2020/03/diagnosing-and-treating-coronavirus-risks-in-ma-transactions,

Simmons, C. (2009). Crisis Management & Organizational Learning: How Organizations Learn from Natural Disasters. Available at SSRN:https://ssrn.com/abstract=1351069 or http://dx.doi.org/10.2139/ssrn.1351069.

Singh, S.(2020). Impact of The Coronavirus on Business, Accessed: 10 March 2020. https://www.forbes.com/sites/sarwantsingh/2020/03/02/impact-of-the-coronavirus-on-business/?sh=2c1036a44414

Smith, K. F., Goldberg, M., Rosenthal, S., Carlson, L., Chen, J., Chen, C., & Ramachandran, S. (2014). Global rise in human infectious disease outbreaks. Journal of the Royal Society Interface, 11(101), 20140950.

Stevenson, A. (2020). Coronavirus Outbreak Tests World's Dependence on China, Accessed: 14 March 2020. https://www.nytimes.com/2020/01/29/business/china-coronavirus-economy.html

Toraks (2011). SARS, Access: 06 March 2020. https://toraks.org.tr/site/community/library/0/full

UNAIDS (2019). Global HIV & AIDS Statistics 2019 Fact Sheet. Accessed: 13 March 2020.https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf,

Vijay, R., (2020). MERS Coronavirus Methods and Protocols (Ed.). Humana Press: Iowa City, IA, USA: ISBN 978-1-0716-0211-9.

Watzlawick, P., Fisch, R., & Weakland, J. H. (1974). Change. Principles of Problem Formation and Problem Resolution.

WHO (2020). Coronavirus, Accessed: 06 March 2020.https://www.who.int/health-topics/coronavirus, World Health Organization,

WHO (2020). Ground zero in Guinea: the Ebola outbreak smoulders – undetected – for more than 3 months, Access:16.10.2020. https://www.who.int/csr/disease/ebola/ebola-6-months/guinea/en/#:~:text=On%2026%20December%202013%2C%20acase%20of%20Ebola%20virus%20disease