

## Airplanes and diseases: a flight should not be an adventure to remember

“It was true, and it came to him in a flash of inspiration one sunlit afternoon when the sea seemed paved with aluminum because of the numbers of fish brought to the surface by mullein (García Márquez, 1988, 88-89).”

The man was looking at the sea from a small boat; it would be very strange to observe a similar spectacle looking down at the sea while flying on an airplane since the altitude is too high to see fish surfacing from the sea. There are other ways where a picture like the one described above can present itself to a traveler. It is a wonderful experience to be able to see the sea shining like silver or aluminum during the middle of the night when one is flying on an airplane high in the sky. It often happens during those full moon nights when there are no clouds to obscure the vision from six or seven miles above the sea. It is an inspiring moment difficult to explain. Maybe it is the moon, maybe it is the shining sea but many travelers never forget the moment their eyes follow the shining light reflected in the calm waves of a quite sea. It is a moment when the mind explores new thoughts, when everything we know seems to be so distant just because we are going from one place to another far apart and the only thing that ties them together are our memories or our expectations. It is a time for inspiring thoughts, for some people it is time for spiritual thoughts because they feel they are closer to God since they are in the middle of the sky.

Especially in those moments, very few of us stop savoring the moment to think about the relationship between airplanes and diseases. Air travel is almost always associated with the joys of vacation. At times it is a necessity because of our job, but business travel can be exciting and pleasant too: between work activities we can have dinners and taste different cuisines, tour our destinations, meet new people and explore new places satisfying our desire to explore and to expand our knowledge. On a sad note, diseases can ruin these beautiful memories or the expectations we have when we see a huge jetliner.

In this paper my goal is to present the other side of the coin, the gloomy one. There are many unpleasant aspects of traveling: airplanes are often uncomfortable and airlines can be difficult to deal with; both the passengers and the people working in or around an airplane or an airport are also exposed to disease related dangers.

There are several ways to help to improve travelers' conditions and to address the various issues related to disease spreading; something can be done by the airlines, by the governments and by the travelers themselves. Because the problems considered relate to situations that are very different, rather than present all of the issues and then all of the solutions together I will separate them and examine one situation at a time.

To begin our journey into the different ways we can discuss, prevent or try to cure diseases related to the airline industry, the first point that comes to mind is the velocity in which infectious diseases can spread around the world by means of travelers: in 24 hours any disease can reach any place in the world by means of an infected person who might very well be unaware of his status and the risk associated with his traveling.

The FAA, in an article about the spreading of communicable diseases by carrier/vectors makes a great comparison between the historic pandemics that plagued the world in the past and those that endanger us today. In the fourteenth century it took five years for the bubonic plague to cross Europe, the speed of an ox cart; then it was cholera traveling all over the world by means of the sailing ships. The 1918 Spanish influenza took six months to go around the world moving on railroads and steamships. In 1958 the Hong Kong flu spread itself in only two weeks because of jet travel. More recently West Nile virus, SARS and the latest Swine flu appeared in places very far apart even before becoming a real danger in the place of origin (DOT FAA, 2005). All of this acceleration in the spreading of disease is because of the extensive traveling done in the world via the airlines.

Law is an abstract term that comes to mind when we have to deal with an issue as big as the one mentioned above; laws are introduced to regulate travel and to try to limit the potential damage caused from the spreading of disease. A law is established in order to provide a solution to a problem and should be effective to the extent of eliminating it. Unfortunately this is not the case for our topic. These laws and regulations can only help limit or delay the effects but in very few cases have eliminated the issue. There are numerous committees, associations and government departments that meet regularly to study the problem and try to come up with solutions.

“After three hours of questions, theoretical assumption, and concrete evidence, with all the employees in the middle of the room, he returned to his office tormented by the certainty that instead of a solution to so many problems, he had found just the opposite: new and different problems with no solution (García Márquez, 1988, 184-185).”

One of the most common situations in addressing a complicated problem is when we have the feeling that the more we talk and evaluate actions and consequences, the more we find additional problems to solve. It is a chain that seems to have no end; like the tip of an iceberg: what we see at the beginning is nothing compared to what is hidden under the water, only once we have looked under the surface can we grasp the complexity of the problem. The following is a situation to consider.

There is an airplane coming from a location on another continent, it is a long flight and the crew had the opportunity to observe a passenger and notice that he could be infected by one of the diseases listed among those that require the captain or the crew to inform the authorities (United States. Office of the Federal Register, 2002, 42 CFR 71.21). The crew takes immediate action and everybody gets ready to receive the airplane and execute the “quarantine plan.” All passengers are transported to a location previously identified and kept there until it is safe for them to be released.

If we stop here it is like addressing the tip of the iceberg, it seems too simple to be true; the brief paragraph used to describe the situation is full of complications, questions and additional problems. Here are some examples of the actions needed to reach positive results. How is the crew able to identify a disease that could potentially require quarantine? They are not doctors therefore their analysis in determining if a person is to be considered an “ill person” has to be superficial and it is usually limited to 2 symptoms: fever and diarrhea. Since they cannot have knowledge of the condition of every passenger, to be effective, they need to be well trained and use their ability to observe and discern the real situation from what they can see about the passenger. As we can imagine, this is not easy to do while they are attending to their duties unless their training was really effective.

After this first step, once the proper authorities are involved, there is the need to examine the ill passengers. Doctors and other medical personnel are usually available in all airport locations and there are provisions to contact the CDC (Center for Disease Control) in order to receive assistance. After proper personnel have been given access to the airplane and have performed the exam, there are bigger problems to consider: is this one of the diseases that requires quarantine? The quarantine is not for the sick individual, he will go to the hospital for treatment; quarantine is for all the other potentially infected people. Federal law, under executive order 13295, states that quarantine is mandatory only for nine diseases: Cholera, Diphtheria, Infection Tuberculosis, Plague, Smallpox, Yellow Fever, Viral hemorrhagic Fevers, SARS and

Influenza coming from a novel or re-emergent source (Stambaugh, National Research Council. Transportation Research Board, Airport Cooperative Research Program, & United States. Federal Aviation Administration, 2008, 3). Everything else has to be decided by the local state authority. If the flight is coming from a domestic location, there is uncertainty about the possible application of federal law.

Once authorities have established the need for quarantine there is the need to determine if, on top of the quarantine itself, there is also a need for isolation because of the risk of spreading the contagious illness people have been exposed to. Isolation and quarantine are not the same thing. Are there suitable locations for quarantine in or near all major airports? There are currently only 20 Federal Quarantine Stations, 19 in airports and one near a land crossing in El Paso, TX. Although those stations cover all of the USA it is obvious that they cannot be easily reached from the 130 international airports in the country. Therefore there is also the problem of transporting the designated people to the nearest location which may involve the same aircraft (causing a huge economic impact on the airline), or ground transportation. In any case there will be the need to follow up with a complete disinfection of the area once all of the passengers have disembarked. It is interesting to note that those existing facilities are not meant to receive the number of passengers traveling on an average international flight; their capacity is generally limited to a few individuals. The location is usually available for free from the local airport authority and it is staffed “part time” with the possibility of being fully operational within 24 hours notice.

Quarantine facilities should not be “concentration camps.” People do not enjoy being kept in places against their will if they do not feel sick. They are not criminals; they have not done anything wrong or anything to be ashamed of. Their feelings need to be considered and their needs addressed. A study has been done to identify the necessities and costs involved in the preparation of a quarantine facility capable of receiving around 200 people. There is the need to evaluate and plan for rooming, communication, privacy, childcare, recreation, medical attention, supplies, clothing, staff to attend basic needs like food and hygiene and so forth. The study highlighted that the cost to quarantine 200 people for 2 weeks including basic, fixed, operational, stand-by, activation and recovery of the facility costs, ranges between two hundred fifty and three hundred thousands dollars. This does not include the cost to keep and maintain the facility available and ready to be used, estimated to be in the range of fifteen thousand dollars per month (Stambaugh et al., 2008).

Who should pay this bill? It is tough to say. In my opinion, influenced by the fact that in Europe health care is a state problem, the federal government should be

responsible unless the local state has more restrictive rules in place but in that case, it should also absorb the cost. Other people will certainly prefer to charge the cost to the insurance companies once the facility is used or to find a way to add a small fee to every airline ticket sold and let the airlines carry the financial burden since they are responsible for bringing infectious disease into the country.

I am convinced that the danger for the entire nation from the outbreak of a serious infectious disease justifies the involvement of the federal government in handling the entire case, from the decisions to the costs, and since it is not reasonably possible to have an adequate facility of the needed size in every airport or state, I would identify a few rural, less expensive, areas where those facilities can be built or locations where former military bases can be used and people can be transported by air within 2 hours. This will limit the cost and keep a system ready to respond to an immediate emergency. In order to be ready to deal with those situations requiring quarantine arrangements, a huge amount of expensive training on the diseases it is required for all non-medical personnel involved, from flight crew to ground staff. Those costs would be absorbed by the airlines themselves.

The simple scenario put forth in the beginning, the initial paragraph used to describe the problem and solution, has evolved now into a complex project involving multiple government branches and large capital investment.

After the appropriate training, much can be accomplished by the people working in the front line, in the airports. Because of the specifics of their jobs their involvement is fundamental.

“However, there’s one thing I must tell you: there’s no question of heroism in all this. It is a matter of common decency. That’s an idea which may make some people smile, but the only means of fighting a plague is – common decency.”

“What do you mean by ‘common decency’?” Rambert’s tone was grave.

“I don’t know what it means for other people. But in my case I know that it consists in doing my job.”

“Your job! I only wish I were sure what my job is! (Camus, 1948, 163)”

We all try to do our job, the teacher does, the banker does, the bus driver too, as well as the guy that works behind his desk in an office building. Some jobs expose us to the risk of catching more diseases than other people and some jobs can help in preventing the spreading of diseases. A doctor can cure people but people working in a hospital have to be careful to avoid contracting the diseases that patients brought in.

The people working in the travel industry are involved in both ways: they are exposed to all the various viruses and bacteria travelers carry with them and they are subject to occupational diseases because of their specific work environment and, at the same time, they can contribute to preventing the spreading of an epidemic disease, by applying the good training they should receive. If an employee in an airport does his work with the confidence that he can detect and stop a potential infected passenger from being harmful to others by preventing him from flying or by isolating him after landing he can make a difference in the effect the passenger and the disease will have on his country.

“Next day the serum arrived by plane. There was enough for immediate requirements, but not enough if the epidemic were to spread. In reply to the telegram Rieux was informed that the emergency reserve stock was exhausted, but that a new supply was in preparation (Camus, 1948, 63).”

Sometimes it is really a matter of time, therefore containment measures at the airports can buy out those weeks or months that would be necessary to produce an effective vaccine in the quantity and amount needed to stop the pandemic. This is especially possible for those countries protected against uncontrolled immigration by their geographical location. A study done in Australia showed how delaying the spreading of an epidemic disease by means of containment measures can provide the time needed to study and produce the vaccine necessary to protect the entire Australian population. An effective vaccine, unfortunately, can only be produced after the virus is changed into pandemic status, therefore isolated countries benefit from vaccines created elsewhere. They can benefit in terms of lives saved and of limited economic damages (Talbot, 2008, 20). Even though reducing the amount of travelers will have an impact on the tourism industry, it will be counterbalanced by the increase in cargo transportation / commerce that will result by people traveling less and by the economic benefits of limiting the spreading of the disease (Turnbull, 2008, 20).

“He rang up some colleagues. As a result of these inquiries he gathered that there had been some twenty cases of the same type within the last few days. Almost all had ended fatally. He then advised Richard, who was chairman of the local Medical Association, to have any fresh cases put into isolation wards. ‘Sorry,’ Richard said, ‘but I can’t do anything about it. An order to that effect can be issued only by the Prefect. Anyhow, what grounds have you for supposing there’s danger of contagion?’ (Camus, 1948, 30)”

For obvious reasons people that work in the industry cannot take it upon themselves to decide which measures are necessary and should be applied. Authorities will determine if isolation, quarantine or containment measures are necessary. Some of the containment measures may include health declaration cards to be filled by disembarking passengers, thermal imaging scanners to detect fever in incoming passengers, the placement of nurses for passenger health assessments at airports, restrictions for traveling to or from determined countries, increased responsibility for the flight crew in declaring passengers healthy and able to be disembarked, and so on (Turnbull, 2008, 20).

Those measures are not rare. In the past year, I have personally witnessed the use of thermal imaging scanners at arrival, of protective masks and gloves for check-in agents and the mandatory filling of a health questionnaire for embarking and disembarking passengers; I have seen passengers taken aside for questioning and aircraft stopped and sealed with all passengers aboard until further checks were performed. Those might seem like annoying measures but they can be effective in buying out precious time.

Another measure often taken is the disinfection of the incoming aircrafts by the airport authorities. In some countries like Australia and other “islands” it is a procedure applied to all incoming planes; in other cases it is limited to flights coming from specific countries with particular problems. If applied effectively, by zealous workers, it can be effective in preventing undesired animals, like certain types of mosquitoes, from entering the country. Many diseases move around the world by means of insects; one of the last was the “West Nile Virus” that came into the Northeast of the USA in the nineties and it is now present all over the country.

The role of airport workers is fundamental in the battle against disease spreading; we have seen before how important it is for them to perform their duties but it is also important that they protect themselves from catching the same diseases they help to keep out of the country. There are some activities that can be performed by telecommuting from home, but most of the front line jobs require people to be there: pilots, flight assistants, maintenance engineers, security and so on. Studies have considered how a forty percent rate of absenteeism will be enough to sensibly reduce the capability of the entire industry to function. Incentives can be used to convince people to come to work even in cases of pandemic risk since it has been noticed that hourly paid workers tend to be more present than salaried workers (Turnbull, 2008, 22).

A good pair of eyes and a well-trained brain can make the difference; in order to get the best result it is very important to give all workers the proper tools, training, motivation and reward if we want their contribution to be really effective. As mentioned, the cost for all this training can be very high and airlines would certainly object to absorbing the cost especially in times of recession; for this reason government should be involved in reimbursing airlines either directly or by means of tax credits.

What about our flight as a passenger? Is it nothing we should be worried about or could it turn into a dangerous situation?

“Let us keep going, going, going, back to La Dorada.” ...

“And how long do you think we can keep up this goddamn coming and going?” he asked.

Florentino Ariza had kept his answer ready for fifty-three years, seven months, and eleven days and nights.

“Forever,” he said (García Márquez, 1988, 348).

He had his reasons for desiring to continue their trip forever. The love of his life was there with him and nobody could have separated them while they were traveling back and forth on a ship flying a yellow flag: cholera on board alert. The longer the trip, the longer his joy would be. Once on ground everything would have changed.

Unless we are living in a dream romance or we are in a complicated love story, an intricate relationship like the one in the quoted book, where travel time spent together is the only reason for traveling, those trips to and from our destination are only the beginning or the end of our journey. We do not want them to be long. Adventure is the word that comes to my mind when I think about traveling: the research of something we do not know, the expectation of meeting new people, of living new situations, of tasting different foods, of being exposed to aromas and fragrances we have never been exposed to. The satisfaction of our need for adventure, the adrenaline boost that we receive when we find ourselves in new places, the discoveries we make when we see with our own eyes what we have been reading about our destination, all of that makes our journey impressed in our memory. We become a different person, we grow, we compare cultures and we bring little pieces of other cultures with us.

While traveling to our destination, it has happened to all of us: we were feeling great, ready for our vacation and happy to have a seat on a big jumbo jet, then during

the flight we notice, a few rows ahead of us, one passenger has difficulty breathing. He sneezes every five minutes and uses a lot of napkins to blow his nose. We are very happy not to be seated close to him and feel sorry for him, since going through the different altitudes, simulated by the pressure changing in the cabin, with a cold could be very painful. A couple of days later we wake up in the morning with the typical cold or flu symptoms and it is difficult to understand why since we are in a beautiful tropical island where the temperature is constantly over 80 degrees. After a while we realize that we must have contracted the same virus of that passenger a few rows ahead of us in the airplane. On our way back we meet some people who were with us in the same plane with the sick passenger and they tell us that they got the cold or the flu too. They were sitting five rows ahead of the sick passenger. How could this be possible? None of us were directly in contact with the sick passenger or were close by him.

Many people in planning for their vacations will consider traveling by airplane; others will fly because of business or other personal reasons. According to some studies (ATAG, 2009, 2), in the year 2007 more than 2.2 billion passengers were transported by air. One of the common fears of the passengers is being exposed to and contracting a disease during their trip in an airplane cabin. Is it a real risk, a possibility? Is the aircraft main cabin more dangerous than any other place as far as risk of contracting diseases? Is it possible that an aircraft cabin is a place where it is easier to transmit / receive diseases even from people sitting far from us? What can be done to help to protect individuals and prevent the spreading of diseases?

To be able to answer those questions it is helpful to understand how the air cabin ventilation works. Airplanes fly fast and high in altitude; it is not like riding in a car where there is the possibility of rolling down the window and letting some fresh air in. The main cabin is pressurized and kept at a comfortable altitude level. This level is a compromise between sea level, where people will not have any problem, and the cruise altitude level that can reach thirty-five thousand feet. It is usually a level around six or seven thousand feet (House of Lords, 2000, ch. 3.29). This compromise allows a condition sustainable for everybody, from the newborn baby to the elderly passenger, and does not put the fuselage of the airplane under too much stress since the amount of differential pressure between the inside of the cabin and the outside will affect the lifespan of the airplane. Such lifespan is measured in cycles; a cycle is intended as one complete take-off / reaching the cruise altitude level / descent to the ground level and landing. It is similar to the life of a rubber band: you can pull it only so many times before it breaks. In the same way there is a limit to the solicitation a fuselage can stand because of the differential pressure. The less we stress it, the more we can use it. Because of this differential pressure and the fact that

air at thirty-five thousand feet is cold, poor in oxygen and it would not be very practical to have it entering the cabin at five hundred fifty miles per hour, we cannot “roll down” or open any window during the flight. The aircraft is sealed off therefore there is the problem of replacing oxygen used by passengers and re-circulating air in the cabin. How is it done?

Until twenty or twenty-five years ago, the ventilation in the cabin was basically a continuous replacement of air pumped from the front to the back of the cabin; the air was taken from outside, compressed, mixed with hot air from one of the stages of an engine to reach the desired level of temperature and humidity and it would exit the cabin from the back through some pressurization valves which were also used to control the cabin altitude level. This system had a few problems: it was a potential vehicle to spread any germ from the front to the back of the airplane and it used a lot of energy because of the hot air taken from the engine which, at the end, was subtracting thrust and power to the same engine. For those reasons new generation airplanes changed the way air is circulated in the cabin. It was a change in the system made possible using a new available technology: HEPA filters. Modern airplanes recycle up to fifty percent of the cabin air; the air is filtered, recycled and replaced completely every few minutes. The use of recycled air allows for more comfortable levels of humidity, although the replacement of the air still keeps the humidity very low which is a cause for the dehydration and respiratory problems travelers often experience. Furthermore, the air ventilation system is engineered to allow recirculation only within the same few seats with the intake in the ceiling and the exhaust valves at the bottom of the seats near the fuselage. In this way the air does not spread through the entire cabin but remains in the same row area (Talbot, 2008, 6).

Because of the close proximity of the passengers in the cabin and the way the air is provided to the passengers, many fear that the cabin of an airplane is a place where the risk of transmitting a disease is elevated. Several studies have been published to determine the risk of spreading a disease by means of air circulation in the cabin. They reached the conclusion that if the recirculation and the filtration systems work, there is no risk that can be attributed to the air in the cabin. A typical case that supports this conclusion is what happened in 1977 in an airplane where seventy-two percent of the crew and passengers were infected with the flu because of one single passenger who developed flu symptoms after boarding (Talbot, 2008, 5). It is important to remember that the flu is contagious for some time before symptoms are evident. This was a perfect case study to understand the reason why almost the entire airplane was affected. The result of the study revealed that the airplane had a mechanical failure and was kept parked with passengers on board for about 3 hours

with the air recirculation and ventilation system off. Since this is not the proper and correct situation, it confirmed that under normal circumstances diseases in one part of the plane are not transmitted to another by means of the air circulation system (Talbot, 2008, 7) (Jordan, 2005).

During the last twenty years specific studies have examined the risks of spreading Tuberculosis, Meningitis, Measles and Influenza and have concluded that, depending on the type of illness and assuming correct functioning of the ventilation system, the contagious area is limited to 2 rows, in the case of Tuberculosis, and can be extended up to 7 rows, in the case of SARS (Lancet, 2005 April 2) (House of Lords, 2000, ch.7) (World Health Organization, 2006, 27).

Since the aircraft cabin is not the primary means of spreading a disease during a flight, how can we be better protected from other sources of contagious diseases while traveling in an airplane? A lot has to do with preventing exposure and contact with viruses and bacteria by applying some common sense rules.

“Someone has told her not to spend more time with her guardian than necessary, not to eat anything he had tasted, and not to put her face too close to his, for old age was contagious. But she didn’t care (García Márquez, 1988, 173).”

Do people really get sick on the plane? Does the risk of getting sick because of the flight discourage people from flying? I asked a few passengers, frequent travelers or simply people who travel only a couple of times per year.

A family that lives between the USA and Australia, a husband and wife with their three year old twins and seven year-old daughter, are among those who get sick every time they get on an airplane: “One time it is the food, another time it is the dry air, one kid gets an ear infection because of the altitude change, another cannot get over the jet lag for a week”, they mentioned that a friend of theirs, always gets sick with a cold and suffers dizziness and needs at least a week to recover. They see flying as an unfortunate necessity, so they do it anyway (Raho 2009).

A law student in New York, who travels back home to Florida during vacations, is not worried at all: “The risk of contracting diseases traveling by plane is much less than the risk we have when we ride the subway, packed like sardines, touching what everybody else touched or when we walk shoulder to shoulder with hundreds of people in the streets of New York.” She travels happily and joyfully thinking of her next destination (Raho 2009).

A married couple in their thirties says they always fly when they go on vacation; they travel often and are not scared at all. They are aware of the potential risk of catching a disease but they reason that if they start to worry about it they will ruin their vacation. The wife even jokes about it: “Something is going to kill me sooner or later, if it will be on the plane, ok; I will die happy in a vacation mood! (Raho 2009)”

A teacher in her early forties, who lives in New York but goes to Italy at least six times per year said: “I would love to avoid the plane and I sometimes change my plans to cancel trips especially if they are only for a few days. Every time I fly I get nervous, I cannot sleep and I always have my legs swollen. I fly only when necessary. I used to like it but I have changed.” (Raho, 2009)

All of those passengers have one thing in common: they fly when they have to, whether they like it or not. They are a little sample of the millions of travelers and if we were to ask all of them the same questions, we would probably get the same answer our six travelers gave us.

What do the professionals have to say about the same topics? What is their view of those problems? It is time for a field trip to interview some of them in their place of work: the airport, the front line, a place I love.

“He hugged Mama and I for a long time, he gave us a little money and his blessing. And so, we aren’t the only ones to go through that door. There are others here on this beach, and elsewhere, thousands of others who are waiting for boats that will sail away and never come back. They are sailing for other worlds, for Canada, South America, Africa, to places where perhaps people are waiting for them, where they can start a new life (Le Clézio & Dickson, 2004, 136).”

In those years after WWII most of the traveling was done by boats, people were waiting in ports and looking at ships that would eventually bring them to their destinations. More recently, airplanes have replaced ships in traveling and airports have replaced ports as starting or arriving points.

I have a particular relationship with airports, both of my parents worked there, they met at the airport, and they got married in the little airport church right before leaving for their honeymoon. I often went with my father when he had to go for an hour or two during his days off to pick up his paycheck or for some other meetings. It was a special day for me: the passengers in line, the check-in counters, the office, all the messages from telex machines and the smell of jet fuel, but more than all those

things, what made it special, was the idea that I was in the place where the entire world was just on the other side of a door: the airplane door. I grew up near an airport and every day I could see hundreds of planes approaching for landing or leaving after take off. I learned to recognize all the different airlines from the color and design of the airplane tails, in some cases I could tell where a specific plane was going to or coming from because of the airline and the time of the day. Later on in my life, after having studied about aircraft maintenance and having acquired more knowledge about engines, I could tell the make and model of the engines from hearing an airplane passing by and therefore in some cases also the aircraft model and the airline; it was fun then to run to the window to check if I was right or wrong.

When I started to work, it was almost natural for me to work in the airport: Rome first, then JFK, then Dulles in Virginia, then JFK again; now that I don't work in an airport anymore I miss it. I miss the people, I miss the smell of jet fuel and I miss the sound of the engines. For this reason I'm always happy to go and visit an airport, every excuse is good: a meeting, the renewal of a badge or, like in this case, an interview.

People in line, luggage to be shipped, friends and family saying good-bye, some are happy, a few have tears in their eyes. It is a common scene at the airport departure level. It is interview time, I have interviewed passengers before, this time I am looking for people who work in the airport, people who know how things work and that can share some inside information or a funny story. I start talking with a lady in Newark Airport, she has been a check-in agent for many years with different airlines; she has also been involved in all sorts of activities at the airport: from lost and found to arrivals, from office activities to gate duties.

We talked about sick passengers at check-in. What do you do if a passenger looks sick, so sick that you doubt his fitness to fly? She said that there is almost nothing that can be done besides asking directly if the passenger is feeling good and if he thinks he is ok to continue with boarding and the rest of his trip. If the passenger says he is fine, than he has all the right to go on board. She told me about one particular passenger she remembers, his face was all yellow, he was skinny and didn't look good at all. They questioned him a little bit and after a while he produced a medical certificate stating he had a particular liver condition that made him look the way he did. That certificate was very helpful because they were able to give an answer also to other passengers that were inquiring about him. That passenger became a frequent flyer, knowing his specific situation helped in dealing with him and with questions from the other passengers every time he was flying. I asked if there are situations when they are aware of a particular problem in advance and if that

is of any help in dealing with the specific passenger with the problem. She told me that there are different cases, they are advised as early as a week in advance when there will be a passenger who is going to require special assistance like oxygen bottles for the flight or that will be embarked from an ambulance on a stretcher. The time in advance is required to arrange for special assistance and to coordinate with airport authorities the security clearance for the passenger, ambulance and all related issues. Another case in which it is required for them to know in advance the special needs of a passenger is when there are high levels of allergy to a specific food. I knew about special meals being arranged (i.e. kosher, vegetarian, gluten free) but in this case she referred to something different: if a passenger has a very high level of allergy to peanuts, they have to organize all catering on board in order for peanuts not to be served during the entire flight in all classes to avoid the passenger being affected by the smell or by some other minor parts of peanuts he can be exposed to (Raho, 2009).

I continued my interviews with a station manager I know. She has been the station manager for a European airline in Newark airport since this winter, before that she worked in JFK and for many years in Belgium. She did not add too much to what I discussed with her colleague but made a few interesting points concerning new dispositions for those in need of a wheelchair. Because those passengers requiring the use of a wheelchair should be treated as everybody else, new aircraft ordered after May 13, 2009 or delivered after May 13, 2010 shall have more aisle room; aisles should be larger than the current ones in order for the passenger to be able to carry his own wheelchair with him on the plane and the wheel chair should be stored in the main cabin instead of the cargo area. This change will also affect the security checks required for embarkation. Concerning questions that passengers in general ask, she told me that they almost never worry about diseases but often ask about the safety and maintenance status of the plane especially if there were recent accidents reported by the media. During my visit I also learned that one of the solutions I thought for a better and less “disease risk” flight, both for passengers and people who works in the airport, has been already applied: the Port Authority in Newark has installed sanitizing gel distributors in many places in the airport so that passengers and workers can use them often (Raho, 2009).

I also had the chance to visit with a station manager in JFK airport. With him, we talked about the swine flu situation and if they were required to do something out of the ordinary in dealing with passengers because of the risk of contracting or spreading the disease. He told me that generally they follow what is required by the USA, since the plane is leaving from JFK with Europe as its final destination. In this case they have been instructed to distribute two papers: one contains instructions on

what to do if, during the following days, they realize they have flu-like symptoms and the other is a form to fill with their personal information and contacts to be used to reach them in case other passengers traveling on the same flight begin manifesting those swine flu symptoms that everyone fears (Raho 2009).

While I was waiting I talked with two passengers leaving for Europe: a couple in their forties. It was not a long conversation because once we touched the disease and travel topic she told me that she spent the last few days in an hospital because her father had an emergency surgery therefore she sees the airplane as the way to escape from a situation that was all about sickness and diseases. I understood and moved on (Raho, 2009).

As my last interview, I talked with a friend who is working as station manager for a European airline in Boston; I could not visit him in the Boston airport but I knew he was going to be in New York for one day and arranged a dinner so I could ask him a few things since he had worked in many airports around the world including Rome, Paris and several in Africa. We talked a little bit more about instructions they receive from authorities in different places and pass on to passengers (Raho 2009).

“On the following day, however, Rieux observed that small official notices had been just put up about the town, though in places where they would not attract much attention. It was hard to find in these notices any indication that the authorities were facing the situation squarely. The measures enjoined were far from Draconian and one had the feeling that many concessions had been made to a desire not to alarm the public (Camus, 1948, 51).”

He confirmed that they have no authority to stop any passenger from traveling and that even though in a few countries in Africa, where some diseases are endemic, they should ask for an international certificate of vaccinations, nobody does it. In their daily activities they usually have to refer to the latest information posted by WHO (World Health Organization) on its website concerning traveling to and from certain areas. He mentioned a few cases he witnessed where authorities acted quickly and without alarming the general public when they thought there could have been risks for disease spreading. One of them happened in Paris, a flight just landed from India and while they were off-loading the cargo area a huge python snake fell down from the belly of the plane. They suddenly stopped and authorities went inside the plane cargo area to check it out. They found a big rat, he specified a big “Indian” rat as in saying that those are of a particular kind, and at that point they stopped all passengers from disembarking and brought the aircraft into a quarantine area. They

examined the rat and found cholera bacteria. The whole aircraft was disinfected and passengers were released only after specific tests had proven they were not affected by cholera (Raho, 2009).

Those were a few points from my conversations with professionals and from my visit to the airports where there are many doors: the door that bring you inside the airport, the door that bring you outside of the airport and the door that brings you to any other place in the world, the one of the airplane.

All those interviews were very interesting but the law student made a good point; it is not the plane cabin environment itself but the proximity of people that can be a problem. In studying the way the system works, we have previously excluded the spreading of germs in the entire cabin because of air circulation and limited the potential risk to the few rows near the infected passenger (Wang, Zhang, Topmiller, Bennet, & Dunn, 2006, Jul 1) and the same conclusion she mentioned has been supported by other research indicating that there is more risk of getting a disease because of people near us in airports or in other crowded areas – i.e. subways - (Talbot, 2008, v). The same studies indicate that the Influenza virus can survive for twenty four hours on hard surfaces and the SARS virus seventy two on plastic surfaces (Talbot, 2008, 8). Fate is another word that comes to my mind in this case. We do not often choose the person who is traveling near us, in line in front of us or standing in the subway behind us. We cannot control their coughing or sneezing or what they have touched some hours before. Last time I got a bad cold or the flu it was because of a man who was sitting near me at Lincoln Center (not on a flight); he kept sneezing and blowing his nose, I got sick along with my wife and a couple of good friends afterwards; I “infected” them before the symptoms were evident.

How can we protect ourselves from those cases when “fate” decides we might be exposed to those agents? As mentioned, common sense is one solution; always wash our hands after we touch places other people touched and never touch our face, eyes, lips, and nose before we are sure our hands are clean. Airlines often embark passengers from the front of the plane; this means that almost all passengers will touch the rows in the front while reaching for their seat. We should be very careful to avoid touching around in the plane during our travel. Further steps can be taken by the airlines by boarding from several different doors, distributing pamphlets at check-in or reminding with announcements at the gate about the danger of direct contact transmission (skin to skin) or indirect contact transmission (surface to skin) of diseases; they can make available or distribute latex gloves, the type used in hospitals, and face masks. They can also install wall mounted sanitizing gel distributors, like those in hospitals, near the embarkation points and request

passengers to use them; I was happy to see, during my visit, that Newark airport started installing them. We cannot pretend this will become a standard procedure in air travel but there is nothing prevent us from carrying our own personal supply of gloves and masks to be used to prevent exposure to germs and always have available one of those pocket sanitizing gels to be used as necessary.

A concept that needs to be introduced it is that of fitness; “fitness to fly” can be defined as the proper physical and mental condition a passenger should have in order to be allowed to board an airplane. It includes not being affected by contagious diseases, being able to put up with the physical stress of flying and having the correct mental attitude needed to avoid being harmful to oneself or others. A terrorist might be physically fit to fly but not mentally fit to be allowed on a plane. A sick person may not be fit to be on a long flight without risking his life or may be dangerous because of the infectious diseases he can pass to the fellow travelers (House of Lords, 2000). In many countries passengers are screened in order to detect potential terrorists and stop them from boarding the plane. This screening is often done by means of specific questions, by observing behavioral patterns and by checking travel documents. In case of epidemic risks, thermal image screenings are performed of all incoming passengers to prevent them from entering the country or to be able to select them for further testing. When there is fear of pandemics those two techniques can be combined and applied to departing passengers to inquire about their health and symptoms and to determine if they would require further testing before embarking. This would require the availability of medical personnel and facilities and some flexibility from airlines in refunding and / or rebooking those passengers who missed the flight because of their health situation and from passengers in exercising patience and understanding for the sake of a greater good. Many can object that the above measures are in violation of privacy and would be very expensive but in extreme situations, when pandemic diseases need to be slowed, those objections cannot be taken in consideration: cost is not an issue and if the passenger wants to keep his privacy, he can always choose another way to travel.

Of course, catching a disease because of a sick passenger is only one of the potential risks we would like to prevent, what about the other problems we do not want to remember our flight for: food, dry air, being dehydrated and bad circulation?

“On the other end, she felt a very strong attraction to the river, she wanted to see the alligators sunning themselves on the sandy banks, she wanted to be awakened in the middle of the night by the woman’s cry of the manatees, but the idea of so arduous a journey at her age, and a lone widow besides, seemed unrealistic to her” (García Márquez, 1988, 324).

The time and effort to reach or come back from our destination should not be part of our adventure; ideally we all want to be in a Star Trek movie where in a blink of an eye we are transported to our destination. Despite our desires and efforts to keep the traveling separated from our adventures, the quickest means of transportation we have available is the airplane and in most cases our adventure starts with our flight.

Our body was not designed to be confined in an aircraft cabin for five or ten hours in close proximity with perfect strangers that can give us their diseases, it does not react very well when it is brought from ground level to eight thousand feet in a matter of a few minutes and even worse when it has to go back to ground level in the same time. The air becomes dry and we get dehydrated, we do not move from our seat where we “comfortably enjoy” a cramped position so that our legs get swollen because blood circulation is difficult. The food served is prepared carefully, at times it is tasty, but it could contain ingredients that we are allergic to, or it can be contaminated by viruses or bacteria that will cause food-poisoning. Our flight becomes a misadventure. The adventure we did not desire, we did not ask for and we did not want to have. It is not part of the fun but people, like those interviewed, fly nevertheless.

“And that is what happened. Fermina Daza spent an agonizing night vomiting bile, strapped to her bunk in a cabin that resembled a tavern latrine not only because of its oppressive narrowness but also because of the pestilential stench and the heat. The motion was so strong that she had the impression several times that the straps on the bed would fly apart (García Márquez, 1988. 95).”

I would never like to feel the way she did while traveling. However it has happened to me: traveling on some overnight flights (red-eye) while having intestine viral problems, and I can assure anybody that might be interested in the details – hopefully nobody would be – that it is NOT a pleasant feeling. The first time I remember, I was coming back from Peru after a wonderful two week vacation. I must have caught something while up in the Andes, maybe “Montezuma’s Revenge”, and I remember fighting it with some antibiotics I was carrying with me from home. It helped a couple of times but on the way back there was nothing I could do except get back in line for the toilet right after I thought I could go back to my seat! Recently it happened again with a seasonal flu; one of those that attacks your stomach and digestive system rather than your respiratory system. Again, it was not pleasant but at least it was not as bad as the long flight back from Peru. There is not much that one can do, besides drinking a lot of fluids, if traveling in the same condition I was. We

just have to get home, or wherever we are going, limiting the damage and hope we will get better soon. Some are able to postpone a trip but that is not always an option.

We spent a few pages already considering the potential risks of getting an infectious disease while on the plane and realized that the probability is very low. This does not mean that there is not a high concentration of bacteria in the plane cabin due to the quantity of people traveling; studies show that especially in the front part during boarding, and in the rear part during the flight, because of people moving to use the lavatories, there are considerably high levels of bacteria but again, common sense, or a few extra precautions like gloves and masks, can prevent us from catching a disease most of the time. An interesting point that I never thought about is that bacteria can be present on surfaces like seat covers and not pose a threat until we stir the dust by sitting or moving in the seat; when we do, everything gets up in the air and the risk of being infected increases (University of Massachusetts Amherst, 2008, May 2). Does it mean we should move as little as possible? I would not agree with that solution. Maybe airlines could do a better job in vacuuming seats between flights using hot water, steam and Hepa filter equipped tools instead of just removing garbage and leftovers during short transits. Even once a day it can be a huge improvement. Choosing a different material for seat covers can help too, leather seat covers allow less dust penetration than cloth and they can be easily cleaned.

The problems we all have in flight, besides viruses and bacteria we bring with us or catch during flight, are the cabin environment and the lack of movement. No matter where we sit we are going to be in a dry, high-altitude environment and that will have an impact on our wellness. As briefly mentioned above, dehydration is a typical phenomenon that affects air travelers and although most of us do not realize it, we all get dehydrated during a flight: our throat starts itching, our eyes too and if we do not take some precautions we'll feel it even after our flight, up to a few days. The only thing to do to prevent it is to drink, a lot. Many agree with the concept but either they apply it by drinking coffee, alcohol and carbonated soda or they are too lazy to get up and get some water (a lot of water). Airlines do not often help because they rarely remind passengers of the need to hydrate during flight, and in some cases flight attendants get annoyed when someone repeatedly asks for water. It is important to understand that alcohol and caffeine cause dehydration and carbonated drinks, that are not healthy anyway, cause some other problems because of gas expansion due to the change of altitude levels in the cabin during flight. It is also recommended to drink a lot of water before, not just during the flight (Mac Kenzie & Gallegher).

Getting up from the seat and going to get water helps also addressing the other issue mentioned before: the lack of movement. A lot of people often say: "I cannot

put my shoes back after a long flight.” I’ve noticed it too: my shoes seem to be smaller after a flight but this cannot be possible, there must be another explanation. Is it dangerous? It could be because of a condition called DVT.

DVT (Deep Vein Thrombosis) is a condition that occurs when a clot forms in a deep vein in a leg affecting circulation. The real danger is when the clot breaks off and through the circulatory system reaches the lungs, at that point a Pulmonary Embolus (PE) can cause severe injury or death (Alex Wolbrink, 2003). In a pilot safety brochure the FAA mentions that the DVT condition is erroneously called by someone “Economy Class Syndrome” because is associated to the limited comfort offered by the seats in economy class. The brochure disagrees with the term because this condition is not limited only to those traveling in economy class but is more related to the inactivity of the traveler for the long periods he is sitting. “Traveler’s Thrombosis” is suggested as a more appropriate term (Alex Wolbrink, 2003). Whatever we want to call the condition, it is an annoying one.

Fortunately there are few cases of injury or death related to DVT after a plane trip but almost everybody has had to cope with swollen feet. I tend to prefer the nickname “Economy Class Syndrome” because of personal experience. When I was younger I didn’t realize that bad circulation could be a real problem. One day, after a 15 hour flight I learned it from my own body; I just bought one of those great noise reduction headsets and got on my Emirates flight to the Middle East. I enjoyed a state of the art entertainment system and saw one movie after another; I probably never got up from my comfortable seat even though I was in a “cramped” position, or maybe I did only one time, and I landed with one calf double the size of the other. I could not believe it but it was true. It took three days to get it back to normal and I learned my lesson: get up often, stretch, move and so on. Very few people die of DVT due to a flight but it has happened in the past. Since then, airlines have approached the problem in different ways: showing a short video once every two or three hours where they demonstrate some exercises to do while seated and printing a couple of pages with the same exercises in their in-flight magazine. Nobody reads the magazine and I have seen very few people doing the exercises. The same “cure” mentioned for dehydration helps with DVT: drink water, avoid alcohol and caffeine; in addition to that it is recommended to take a walk in the cabin and do some stretching and moving of feet and calves while seated (Alex Wolbrink, 2003) (House of Lords, 2000, ch 6).

I think airlines should do something more to help people to suffer less from those two issues; I would love to see them take what I call the “Southwest” or the “Virgin Airlines” approach to the situation. Those two airlines are among the few that have addressed passenger problems in unconventional ways getting away from the

old business attitude. Southwest was famous because of the change in style of flight attendants, they started dressing them in shorts when the weather is appropriate, and encouraged them to joke and be friendly with passengers; Virgin introduced some new extra services for passengers like massages, available for a fee, in business and first class. Massages can really help in preventing DVT but unfortunately, not all passengers have access to the service. One new thing that can be experimented with is the “imitate me” approach. Rather than pointing to a video, some friendly and smiling flight attendant, maybe dressed in gym attire, can start calling attention to 10 minutes of exercise every few hours during the flight trying to involve as many passengers as possible in the activity. Something like the entertainment crew in a cruise ship when they push and pull all the people sunbathing in their chairs to participate in those “swimming pool games” most people hate. After the exercise session they can encourage everybody to drink water, pushing it hard until all drank at least two or three glasses. This will make the passengers move, exercise and in a short time they will have to get up to use the toilettes: a little bit of extra exercise and cabin walk to prevent DVT. It might be necessary to have some more lavatories available on the aircraft and this will generate more costs and less revenue for the airlines, but people will be less sick, more happy and they will remember the flight thinking of that beautiful hostess who was so nice in her way of encouraging exercise or that macho steward in his tiny t-shirt with all his muscles in sight who was so funny and kind in distributing water. No matter the reason, they would be in for a better flight than they are used to.

Many would object to those solutions. There are those who absolutely hate to use the lavatories and for this reason they like to avoid drinking liquids on board and there could be ethical or religious implications to have members of the flight crew acting as trainers in gym attire. Some people would not like their kids to see it or it could be considered an offense to the moral sense of those that due to their religion or education feel that people should behave in a more conservative way. In any case, I am sure that the solutions I mentioned can be adjusted to leave freedom of choice and can be applied in a flexible way depending on the applicable market and the feelings of the travelers.

Everything can be available “for a price”, and airlines can also offer better air to those passengers who feel that the air in the cabin is poor in oxygen because of the cabin altitude level. Some seats or rows can be arranged in a way that air with higher oxygen percentage content can be available either through masks or just because more oxygen is mixed in the air re-circulated for those specific rows. This would require installing a few extra oxygen tanks, or generators and some costly modification in the plane; airlines can object that the risks for safety and the costs are

too high for the project to be implemented, but a safe installation is possible and the extra revenue and the return from publicity would certainly cover the costs.

I would be happy to fly with that arrangement in place; I will use the lavatory a lot more but this time it will not be because of the flu or Montezuma's Revenge, I would reach my destination in the best shape I have ever been after a flight.

Disease spreading and comfortable conditions during a flight are only some of the common problems to face when traveling by airplane but, as we briefly discussed, there are ways to improve situations involving the federal government, the airlines and the travelers. The federal government should be ready with appropriate quarantine plans, absorbing all costs involved. Airlines should be thorough in training their employees concerning diseases, how to recognize them and how to deal with people who might be involved in those situations where the risk of spreading a disease is real. The same airlines should be proactive in making available to passengers simple tools like gloves, face masks and to inform them of the "common sense" solutions they can use to protect themselves. Flight crews should be more insistent with passengers to have them drink more water and to join in exercises during the flight to prevent dehydration and DVT. Passengers should cooperate and use common sense when traveling by plane, the same required when they use other means of public transportation.

All of this will make flying, if not an enjoyable experience, at least less of an ordeal to be forgotten.

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