



Preventing Spread of Coronavirus Disease 2019 (COVID-19) Guideline

for Airlines

Fifth Edition

In order to prevent the spread of COVID-19 pandemic via aviation, provide further guidance for transport airlines to carry out normalized epidemic prevention and control, satisfy the actual demand resulting from the recovery of domestic production and living activities and the increase of international travel of people, adjust relevant prevention and control strategies as guided by the principle of “targeted prevention and control, and targeted measures”, and reinforce the detailed prevention and control measures, the Fifth Edition of *Preventing Spread of Coronavirus Disease 2019 (COVID-19) Guideline for Airlines* is developed.

1. Assessment of Flight Risks and Differentiated Management

1.1 Risk Assessment of Domestic Flights

1.1.1 In principle, domestic flights are no longer classified into different risk levels; instead flights are subject to normalized prevention and control management measures.

1.1.2 In case of regional epidemic resurgence at places of origin of domestic flights, prevention and control measures of various flight risk levels will be adopted depending on the corresponding level of emergency events of public health response as determined by local governments or other relevant requirements. The details are as follows:

1.1.2.1 Measures in line with the prevention and control requirements for high-risk international/regional flights should be taken if local authority activates a level-I emergency event response.

1.1.2.2 Measures in line with the prevention and control requirements for medium-risk international/regional flights should be taken if local authority activates a level-II emergency event response.

1.1.2.3 In other circumstances, measures in line with domestic normalized prevention and control requirements should be taken.

1.2 Flight Risk Assessment of International/Regional Flights

1.2.1 International/regional flights are subject to leveled and differentiated management,



as they will be classified into three levels, namely high, medium and low-risk flights, by a comprehensive rating based on indicators such as epidemic situation at the point of origin, flight distance and passenger load factor, and adjusted by other considerations including provision of passenger health certificates. See Attachment 1 and 2 for details of rating and adjustment methods.

1.2.2 According to the risk levels of international/regional flights, differentiated prevention and control measures shall be adopted in terms of personal protection for crew, in-flight service and environment hygiene of aircraft, to optimize allocation of resources.

1.2.3 Flight risk levels shall be subject to real-time adjustment according to epidemic developments.

2. Normalized Prevention and Control Measures for Domestic Flights

2.1 Prevention and Control Measures for On-duty Crew

2.1.1 See Attachment 3 for personal protection standards for crew of domestic flights.

2.1.2 Considerations of wearing masks:

2.1.2.1 The mask should be close to the face, covering the nose and mouth completely. When the mask is on or being removed, the crew must not touch the out layer of the mask with hands to avoid hand contamination.

2.1.2.2 Once dampened by secretions or contaminated by other contaminants, facial masks must be replaced immediately with new ones, and hands should be cleaned with sanitizer both before and after the replacement.

2.1.2.3 Disposed masks should be placed in a dedicated waste bag for centralized disposal after flight.

2.1.3 Considerations of in-flight service:

2.1.3.1 Crew members should avoid close contact with passengers without effective protection.

2.1.3.2 Crew members should enhance hand cleaning and disinfection before meal, after using lavatory and before and after contact with passengers by using alcohol-based disinfection wipes or non-alcohol rinse free hand sanitizer. When crew members are not sure whether their hands are clean or not, they should avoid touching the noses, mouths and eyes with hands.



2.1.3.3 When sneezing or coughing, crew members should try to lower the head or turn away from passengers and other crew members nearby, and cover the mouth and nose with tissue or flexed elbow.

2.1.3.4 An exclusive lavatory for crew members should be assigned when conditions allow, otherwise the lavatory should be disinfected every time before and after use by crew members.

2.1.4 Crew members should pay close attention to their own health status, and timely report information in case of any abnormal situations.

2.2 Prevention and Control Measures for Air Travelers

2.2.1 Temperature Screening

Passenger hand hygiene should be done before boarding, and non-contact body temperature measurement equipment (calibrated) should be used to examine the body temperatures of the pre-boarding passengers and observe any potential symptoms. If any suspicious passenger is found with such symptoms as fever ($\geq 37.3^{\circ}\text{C}$), fatigue or dry cough, crew members should timely report and handle, and provide support in the takeover.

2.2.2 Recommendations on In-flight Prevention and Control

2.2.2.1 Passengers should wear masks during the whole flight, and should not remove their masks if it is not necessary.

2.2.2.2 Passengers should clean and disinfect hands before meal and after using lavatory, and avoid touching the noses, mouths and eyes if the hands are not sanitized.

2.2.2.3 Passengers should ask crew members for help once they find themselves with symptoms such as fever, dry cough or fatigue.

2.2.2.4 Disposed masks should not be randomly thrown away, instead they should be put in a sealed waste bag.

2.3 Prevention and Control Measures for In-flight Service

2.3.1 In-flight announcements before takeoff and during flight should include matters regarding on-board prevention and control which require passenger attention, which should at least cover 2.2.2 Recommendations on In-flight Prevention and Control under 2.2 Prevention and Control Measures for Air Travelers.



2.3.2 In-flight service should be simplified with meals being provided in the usual way but excluding raw aquatic animal products. Crew members should clean and disinfect hands before and after food preparation.

2.3.3 Passengers with symptoms should be provided with masks, disinfection wipes and disposable medical rubber gloves.

2.3.4 Passengers should be arranged to use lavatory in order, so as to avoid gathering outside the lavatory and to keep social distance while waiting. Lavatories should be disinfected every 2 hours (or after being used 10 times).

2.4 Routine Cleaning and Preventative Disinfection of Aircraft

2.4.1 Wet process cleaning for aircraft should be applied during a stopover, a thorough cleaning upon the completion of the flight, and preventative disinfection at least once every month.

2.4.2 Please refer to Attachment 3 for personal protection standards for aircraft cleaning personnel and disinfection personnel. Disinfection personnel should have obtained relevant qualifications or accepted trainings before performing duty.

2.4.3 Please refer to Attachment 4 for detailed aircraft cleaning methods. Cleaning of lavatories and galleys should be prioritized if conditions are limited.

2.4.4 Please refer to Appendix 1 for preventative disinfection procedures and choice of disinfectants.

3. Differentiated Prevention and Control Measures for International/Regional Flights

3.1 Prevention and Control Measures for On-duty Crew

3.1.1 Personal Protection Equipment (PPE)

3.1.1.1 According to flight risk levels, crew members should follow different protection standards, see Attachment 3 for details. When wearing personal protection equipment, attention should be paid to the following:

3.1.1.2 The mask should be close to the face, covering the nose and mouth completely. When the mask is on or being removed, the crew must not touch the out layer of the mask with hands to avoid hand contamination.



3.1.1.3 Once dampened by secretions or contaminated by other contaminants, facial masks must be replaced immediately with new ones, and hands should be cleaned with sanitizer both before and after the replacement.

3.1.1.4 Flight crew members should wear masks while in the cockpit and crew rest area. Crew members flying high-risk flights should change their masks at least once every 4 hours (or whenever necessary).

3.1.1.5 Reusable goggles should be sterilized and dried every time after use. Goggles with anti-fogging films should avoid being wiped with disinfectant. Instead, it is recommended that they be washed with clean water before being exposed to close-range direct ultraviolet lighting for over 30 minutes.

3.1.1.6 All disposable protective equipment, after their use, should be placed in dedicated waste bags, packed and sealed as per requirements of the arrival airport and safely handed over to ground staff.

3.1.2 Prevention and Control Measures for In-flight Service

3.1.2.1 Flight attendants should be assigned as possible to only provide service in their designated areas to enable zoned management, and avoid cross-area service if not necessary. In the meantime, close contacts between flight attendants and passengers without effective protection should be avoided.

3.1.2.2 High-risk flights should only be provided with necessary in-flight service, and flight crew working areas, passenger sitting areas and quarantine area on an aircraft should be served by different flight attendants.

3.1.2.3 Crew members should enhance hand cleaning and disinfection before and after contact with passengers by using alcohol-based disinfection wipes or non-alcohol rinse free hand sanitizer. When crew members are not sure whether their hands are clean or not, they should avoid touching the noses, mouths and eyes with hands.

3.1.2.4 When sneezing or coughing, crew members should try to lower the head or turn away from passengers and other crew members nearby, and cover the mouth and nose with tissue or flexed elbow.

3.1.2.5 After touching or disposing wastes, hands should be cleaned with soap or hand sanitizer under running water followed by hand cleaning and disinfection.

3.1.2.6 Flight crew members should reduce their entry/exit of the cockpit and use intercom system for communication whenever they can to avoid close contact.



3.1.2.7 Crew members should avoid two of them dining at the same time, and disinfect hands before meals.

3.1.2.8 Crew members should use an exclusive lavatory and reduce their use of the lavatory.

3.1.3 Health Management of Crew Stationed Abroad

When stationed abroad, Crew members should be mindful of personal protection and pay close attention to their own health status, in particular, they should enhance awareness of prevention and control when stationed at high-risk countries/regions. Recommendations are as follows:

3.1.3.1 When stationed abroad, crew members should not visit crowded places and should reduce unnecessary outings. If they do need to go out, they should report to the Pilot-in-Command who should report on a daily basis the crew whereabouts to the relevant department of the airline.

3.1.3.2 The chief flight attendant should keep a daily record of the body temperature of the crew, keep a close watch on their health status, and timely report any abnormalities that may arise.

3.1.3.3 While staying abroad, crew members should avoid collective dining and are encouraged to dine separately. It is recommended to order take-out meals which should be picked up by a designated person, so as to avoid crowds resulting from simultaneous picking up by several people. If crew members are required to dine in a canteen, the distance between seats should be increased to the greatest extent possible (at least 1 meter apart), they should not sit next to each other or facing each other, nor be allowed to converse with each other.

3.1.3.4 While staying abroad, crew members should have themselves well protected except when being indoors alone. They should avoid going to places with poor ventilation for physical exercise. Also, they should wear masks and goggles while taking elevators (no direct contact with elevator buttons) or having contact with others, and keep a distance of over 1 meter whenever possible.

3.1.3.5 Their rooms should be ventilated frequently and the use of central air conditioning system should be avoided to the extent possible. Attention should be paid to maintaining clean and hygiene by removing garbage on a daily basis and leaving no kitchen waste indoors, so as to avoid potential indoor air pollution and the spread of pathogenic



microorganisms. After checking in, crew members should first of all disinfect the frequently touched surfaces (such as door handles, power switches and seat armrests).

3.1.3.6 After returning from public places, they should have their hands cleaned and disinfected in a timely manner to reduce the risk of spread of pathogenic microorganisms through indirect contact and digestive tract.

3.1.3.7 Airlines should communicate information on epidemic development by informing crew members of the changes in local epidemic development in a timely manner. They should provide crew members with a sufficient amount of protective equipment of different varieties.

3.1.3.8 Overseas stations (offices) should provide necessary support by providing food and daily necessities so as to cut the unnecessary outings of the crew.

3.2 Prevention and Control Measures for Air Travelers

3.2.1 Temperature Screening

3.2.1.1 Passenger should clean their hands and keep hygiene before boarding, and non-contact body temperature detection equipment (calibrated) should be used to measure the body temperatures of the pre-boarding passengers and observe any potential symptoms. If any suspicious passenger is found with such symptoms as fever ($\geq 37.3^{\circ}\text{C}$), fatigue and dry cough, crew members should timely report and handle, and cooperate in the takeover.

3.2.1.2 For flights with duration over 4 hours, measurement of body temperature should be taken once during flight operation. In case of ill passenger(s) found with such symptoms as fever ($\geq 37.3^{\circ}\text{C}$), fatigue and cough, the event should be dealt with in compliance with the guidance for the handling of in-flight emergency medical events in this Guideline, and the crew should timely communicate with the destination airport, and cooperate in the handover of the passenger(s) after landing.

3.2.2 Advice for In-flight Prevention and Control

3.2.2.1 Passengers should wear masks during the whole flight, and should not remove their masks if not necessary.

3.2.2.2 Passengers should reduce unnecessary movement in the cabin, reduce use of the lavatory, use lavatory orderly as guided by flight attendants and timely clean and disinfect hands after use.



3.2.2.3 Passengers should timely clean and disinfect hands before meals or after touching surface of objects in the cabin, in particular those frequently touched such as armrest and door handles of lavatory, and avoid touching the noses, mouths and eyes if their hands are not sanitized.

3.2.2.4 Passengers should ask crew members for help once they find themselves with symptoms such as fever, cough and nausea.

3.2.2.5 Disposed protection equipment (such as masks, disposable gloves, etc.) must not be randomly thrown away, instead they should be put in dedicated waste bags.

3.3 Prevention and Control Measures for In-flight Service

3.3.1 Division of Areas

3.3.1.1 The last three rows of seats on international flights should be reserved as a quarantine area for handling of possible in-flight emergencies. Efforts should be made to arrange passengers to sit in dispersion. Passenger load factor of high-risk flights shall not exceed 75% in principle.

3.3.1.2 Designation of Exclusive Lavatory

The front lavatory should be assigned for exclusive use by crew members, and if conditions don't allow, the lavatory should be disinfected every time before and after use by crew members. On high-risk flights, when conditions allow, two lavatories should be assigned for separate use by flight crew and cabin crew.

The lavatory on the rear right side of the cabin should be for the exclusive use by those under quarantine.

3.3.2 Information Promotion on Prevention and Control Measures

In-flight announcements before takeoff and during flight should include matters regarding on-board prevention and control which require passenger attention, which should at least cover 3.2.2 Recommendations on In-flight Prevention and Control under 3.2 Prevention and Control Measures for Air Travelers.

3.3.3 Catering Service

3.3.3.1 Low-risk flights: normal meal service should be provided by serving hot meals, while cold dishes, cold meat and edible ice cubes should be cancelled. The cabin crew should clean and disinfect their hands before and after meal preparation.



3.3.3.2 Medium-risk flights: food-preparation procedures should be simplified, pre-packaged food should be provided, and cold meal, cold meat and edible ice cubes should be canceled.

3.3.3.3 High-risk flights: it is recommended to provide pre-packaged food and bottled water before or during passenger boarding. Except for special needs, catering service should not be provided onboard. Passengers are encouraged to dine by odd and even line numbers separately in different batches.

3.3.4 Provision of Protection Equipment

3.3.4.1 Passengers with symptoms should be provided with masks, disinfection wipes and disposable medical rubber gloves.

3.3.4.2 Passengers sitting in quarantine area with symptoms should be provided with necessary medical protection equipment.

3.3.4.3 Supply of magazines should be canceled on high-risk flights, and blankets and pillows should no longer be provided except for special needs.

3.3.4.4 Waste collection bags for protection equipment should be additionally put in seat pocket on high-risk flights.

3.3.4.5 For high-risk flights with duration over 8 hours, it is recommended to provide exclusive protection kits for each crew member.

3.3.5 Use of Lavatory

3.3.5.1 Passengers should be arranged to use lavatory in an orderly way, so as to avoid gathering outside the lavatory and to keep social distance while waiting.

3.3.5.2 According to different flight risk levels, lavatories should be disinfected at corresponding frequency, and hand cleaning and disinfection should be done upon completion of lavatory disinfection.

3.3.5.3 Lavatories should be disinfected every 2 hours (or after being used 10 times) on low and medium-risk flights; or every hour (or after being used 5 times) on high-risk flights.

3.3.6 Other Matters

3.3.6.1 On high-risk flights, aircraft air conditioning system should be set at maximum



ventilation during flight to ensure efficient air circulation in the cabin.

3.3.6.2 All disposable protective equipment, after their use, should be placed in dedicated waste bags, packed and sealed as per requirements of the destination airport and safely handed over to ground staff.

3.4 Routine Cleaning and Preventative Disinfection of Aircraft

3.4.1 Routine Cleaning of Aircraft

3.4.1.1 Wet process cleaning for aircraft should be applied during a stopover, and a thorough cleaning upon the completion of the flight.

3.4.1.2 Please refer to Attachment 4 for detailed aircraft cleaning methods. Cleaning of lavatories and galleys should be prioritized if conditions are limited.

3.4.1.3 Please refer to Attachment 3 for personal protection standards for aircraft cleaning personnel.

3.4.2 Preventative Disinfection of Aircraft

3.4.2.1 Preventative disinfection should be carried out upon the completion of the flight for at least once every week for low and medium-risk flights, or after every flight for high-risk flights.

3.4.2.2 Assessment on the effectiveness of post-flight disinfection should be conducted on regular basis for high-risk flights if conditions allow.

3.4.2.3 Disinfection personnel should have obtained relevant qualifications or accepted trainings before performing duty. Please refer to Attachment 3 for personal protection standards for disinfection personnel.

3.4.2.4 Please refer to Appendix 1 for preventative disinfection procedures and choice of disinfectants.

4. Routine Aircraft Maintenance

4.1 While changing HEPA, maintenance personnel should be personally protected as stipulated in Attachment 3.

4.2 Upon arrival, cabin and cargo hold doors should be opened for ventilation before



maintenance work is performed, and the time for natural ventilation should be extended.

4.3 High Efficiency Particulate Air (HEPA) filters should be replaced in accordance with what's specified in the manufacturer's manual, in strict compliance with the prevention and protection requirements set out in the Aircraft Maintenance Manual, and in accordance with the personal prevention and protection program for aircraft maintenance personnel. Used HEPA should be placed in a special plastic bag, disinfected with chlorine disinfectant and sealed.

4.4 Upon the completion of the maintenance task, the maintenance staff should disinfect their hands and remove their protective equipment in the specified order before cleaning and disinfecting their hands thoroughly.

5. Handling of In-flight Medical Emergencies

5.1 Principles to Be Followed during Handling

If any passenger on board is found with fever, fatigue, dry cough or other suspicious symptoms, they should be handled immediately in accordance with the following procedures:

5.1.1 Before coming into contact with passengers with suspicious symptoms or contaminants of a contagious nature (such as vomit, excretions or blood) or contaminated articles or surfaces, crew members should wear personal protective equipment as described in Attachment 3.

5.1.2 Passengers with suspicious symptoms should sit in the window seats on the right side of the pre-set emergency quarantine area, so as to discharge, to the greatest extent possible, the exhaled air directly out of the aircraft.

5.1.3 The rear lavatory on the right side should be reserved exclusively for those under quarantine to avoid cross infection.

5.1.4 It is recommended that a flight attendant be designated to provide them with essential in-flight services. Except the need for safety operation, the flight attendant designated should reduce close contact with other crew members.

5.2 Aircraft Concurrent Disinfection

5.2.1 When contaminated by blood, secretions, excretions, vomit and other liquid contaminants, aircraft cabin should be disinfected concurrently.



5.2.2 Operating procedures and disinfection protocols for concurrent disinfection contain in Appendix 2.

5.3 Aircraft Terminal Disinfection

5.3.1 If an aircraft is found to have carried passengers with suspicious symptoms, a post-flight terminal disinfection of the whole cabin should be conducted.

5.3.2 If animal remains or suspicious contaminants of a contagious nature are found in the cargo hold, post-flight terminal disinfection of the cargo hold should be performed.

5.3.3 Operating procedures and disinfection protocols for terminal disinfection contain in Appendix 3.

6. Quarantine Program for Crew Members

The quarantine program should be implemented by referring to the latest edition of *COVID-19 Prevention and Control Program* issued by the National Health Commission, taking into account of the special nature of crew members' working schedules, and following the guidelines below.

6.1 Crew Members Quarantine Program

6.1.1 If any crew member shows such symptoms as fever, fatigue or dry cough during off-duty hours, and has a history of epidemiology (such as a history of living, traveling and having contacts with people in high-risk countries/regions), he/she should be handled in accordance with the requirements in the *COVID-19 Prevention and Control Program*. Crew members who performed duty on the same flight on the day or during the previous 2 days and who had close contact with him/her within the past 2 days should be instantly put under centralized quarantine, and where conditions do not allow, they can be put under house quarantine and medical observation.

6.1.2 If any crew member shows such symptoms as fever, fatigue or dry cough during the duty hours, he/she should cease performing his/her duties immediately as long as flight safety is not compromised. It is recommended to put him/her under quarantine in the cabin emergency quarantine area and avoid his/her close contact with other crew members. After the flight has landed, a special vehicle should be sent following the deplaning of passengers and other crew members, carrying him/her to a designated medical facility for examination. Other crew members should be quarantined as per 6.1.1.

6.1.3 Where any passenger onboard shows such symptoms as fever, fatigue or dry cough,



the crewmembers who have provided in-flight services for the symptomatic passenger should be under centralized quarantine after the flight has landed, and where conditions do not allow, they can be under house quarantine and medical observation. Other crew members do not need to be quarantined for the time being. If the crew members having direct contact with the passenger have been personally protected throughout the journey in accordance with this Guideline, they may not be quarantined as close contacts. All crew members need to monitor their health conditions and report promptly any abnormalities that may occur.

6.1.4 Where an airline has been informed by local disease control or quarantine department that a flight operated by the airline did carry confirmed, suspected or asymptomatic case(s), the crew members involved should be quarantined as per 6.1.3.

6.2 Quarantine Period

6.2.1 The medical observation period refers to 14 days after the last contact of a quarantined crew member with confirmed, asymptomatic or suspected cases, or passengers or other crew members with suspicious symptoms.

6.2.2 During this period, if the suspected cases or the individuals with suspicious symptoms have been cleared by the disease control department, the aforementioned crew member should be released from quarantine and medical observation.

6.3 Quarantine Measures

6.3.1 Crew members under medical observation should report their body temperatures and health conditions to the relevant department of the airline every morning and evening.

6.3.2 Crew members under centralized or house quarantine should stay in a relatively separate space which should be regularly cleaned and disinfected, and minimize their contact with others who share the same apartment.

6.3.3 Crew members shall not have outings during the observation period. If they have to go out, they should report to the relevant department of the airline, wear a surgical mask and avoid crowded places.

6.3.4 The airline concerned should keep a record of the health conditions of the crew members under medical observation, as well as the record of their outings.

6.3.5 Once a crew member shows any symptom during medical observation (such as fever, chills, dry cough, cough, expectoration, nasal congestion, runny nose, sore throat, headache, fatigue, muscle soreness, breathing difficulties, dyspnea, chest tightness, conjunctival hyperemia, nausea, vomiting, diarrhea or abdominal pain), the airline concerned should report



to the local public health department immediately and send the crew member to a designated medical care facility for diagnosis and treatment.

6.3.6 After the medical observation period, the crew member should be released from medical observation if showing no signs of symptoms.

7. Considerations Regarding Psychological Self-regulation for Airline Front-line Personnel

As the epidemic situation is gradually getting better, prevention and control activities have been normalized among airlines. Continued efforts should be made in providing humanistic care and psychological counseling for employees, to calm down negative emotions in time. As the front-line crew members are still under pressure as they have to support flight operation and practice self-protection, we need to follow their mental health conditions in an ongoing manner. On the one hand, we should continue to provide and make the general public aware of effective mental health services to ensure that crew members can seek help in a timely manner when necessary. On the other hand, a health assessment should be made on the psychological stress and resilience of front-line crew members taking into account of the workload during the epidemic, and their mental health conditions under long-term pressure should be assessed and classified, to facilitate subsequent effective psychological assistance and work arrangements.

8. Proper Use of Personal Protective Equipment (PPE)

In order to provide guidance to front-line staff in civil aviation on how to correctly wear masks, hats, gloves, goggles and other protective equipment, and properly sanitize hands, our Office made a video, which can be downloaded from the website ams.caac.gov.cn under Prevention and Control of Public Health Emergency.



Attachment 1

Recommended Scores for the Purpose of Identifying the Risk Levels of International/Regional Flights

Factors	Scores					
	1	2	3	4	5	6
Prevalence rate at the point of origin (per million)	0-50	51-100	101-200	201-500	501-1000	>1000
Passenger load factor (%)	0-60	61-80	>80	—	—	—
Flight Duration (in hours)	<4	4-8	>8	—	—	—

Note:

1. Prevalence rate at the point of origin is the number of currently existing confirmed cases per million people.
2. The number of currently existing confirmed cases at the point of origin should be that identified by the nation or region (data source: WHO and the official website of the country or region).
3. Risk level of flights will be updated on a daily basis.
4. While identifying the risk level of transfer flights, the higher score of the two segments should be chosen; and while identifying the risk level of stop-over flights, the flight duration should be that of the whole journey.
5. Cargo flight should be scored assuming a load factor of 0.
6. Risk level can be upgraded as appropriately in case of emergencies and special flights.
7. If all passengers can provide negative results of the viral nucleic acid test by RT-PCR conducted within 120 hours before boarding or within the time limit required by the National Health Commission, the score of the flight can be adjusted by deducting 2 points from the total score, and the risk level of the flight should be the one corresponding to the adjusted total score.
8. Risk level can be divided into high, medium and low based on the total score of the three factors:



low risk flight: total score of 3-6;
medium risk flight: total score of 7-9; and
high risk flight: total score of 10-12.



Attachment 2

Population of Some Countries/Regions in 2020 (in millions)

China	1400	Republic of Korea	51	Switzerland	9
United States	327	Spain	46	Austria	9
Brazil	211	Canada	37	Israel	8
Japan	127	Malaysia	32	Denmark	6
Iran	82	Australia	25	Norway	5
Germany	82	Netherlands	17	Czech	5
United Kingdom	67	Belgium	11	Qatar	3
France	65	Sweden	10	Hong Kong (China)	8
Italy	60	Portugal	10	Taiwan (China)	24



Attachment 3

PPE Recommendations for Crew Members, Maintenance and Cleaning Staff

Personnel Category	Flight classification (risk)	Masks				Goggles	Disposable Protective Suit	Disposable Medical Rubber or Nitrile Gloves	Disposable Shoe Covers	Disposable Medical Cap
		Disposable Medical mask	Surgical Mask	KN95/N95	Medical Protective Mask					
Flight Crew	Domestic	√								
	International/Regional(low/medium)		√					√		
	International/Regional(high)		√			√		√		
Cabin Crew	Domestic	√								
	International/Regional(low/medium)		√					√		
	International/Regional(high)			√		√		√		
	Emergency Handling				√	√	√*	√***		
Maintenance Staff	Replacing HEPA			√		√	√	√	√	√
Cleaning Staff***	Domestic	√						√		
	International/Regional(low/medium)		√					√	√	√
	International/Regional(high)			√		√		√	√	√

* In special circumstances, the protective apron in the epidemic prevention kit can be used instead, as a temporary emergency handling measure.

** Double layer disposable rubber gloves.

*** Cleaning staff are advised to wear long clothes (or sleeves) and trousers on high-risk flights to prevent skin exposure.



Attachment 4

Aircraft Cleaning

Area	Items to be Cleaned	Stopover Duration		Post-flight
		<60min	>60min	
Flight Deck	Clean tray tables and cup holders	If necessary	√	√
	Clean lockers and racks	If necessary	√	√
	Wipe pilot seats	If necessary	√	√
	Clean floor/vacuum carpet	If necessary	If necessary	√
	Clean windscreen	If necessary	If necessary	√
	Clean doors and wall panels	If necessary	If necessary	√
	Empty ashtrays (if installed)	√	√	√
Passenger Cabin	Dispose of wastes in closets	√	√	√
	Dispose of litter and newspapers	√	√	√
	Dispose of wastes in seat pockets	√	√	√
	Clean tray tables	If necessary	If necessary	√
	Clean cabin crew tray tables	If necessary	If necessary	√
	Clean interphone mic	If necessary		√
	Clean cabin windows			√
	Vacuum cloth-covered seats		If necessary	√
	Wipe leather-covered seats		If necessary	√
	Clean overhead bin outside surface and its latch	If necessary	If necessary	√
	Dispose of wastes in overhead bins		If necessary	√
	Clean PVC floors			√
	Vacuum carpet		If necessary	√
	Replace pillows, headrest covers and blankets			√
Clean seat-backscreens and control panels			√	



CAAC

	Clean seats and armrests	If necessary	If necessary	√
	Remove and vacuum passenger seat cushions			√
	Remove carpet stains			√
	Clean seat rails, air outlets, ceiling, side wall panels, lockers, bulkheads and magazine racks			√
Galleys	Empty waste bins and waste bags	√	√	√
	Clean bulkheads, trolley brake blocks, ceiling and ventilation grille(air-conditioning outlets)	If necessary	If necessary	√
	Clean faucets, sink countertop	If necessary	√	√
	Clean retractable countertop	If necessary	√	√
	Clean ovens both inside and outside	If necessary	If necessary	√
	Clean galley trolleys	If necessary	√	√
	Clean PVC floors	If necessary	If necessary	√
Lavatories	Empty waste bins and waste bags	√	√	√
	Clean toilet	√	√	√
	Clean sink, faucet and countertop	√	√	√
	Clean mirrors	√	√	√
	Clean baby care table	√	√	√
	Clean wall panels, door surfaces both outside and inside, handrails and latches	√	√	√
	Clean PVC floors	√	√	√
	Replenish hand sanitizer	If necessary	√	√
	Replenish toiletry items	If necessary	√	√
Crew Rest Areas	Remove waste in lockers		√	√
	Remove litter/newspapers		√	√
	Remove bed sheets, and other items		√	√



	Clean pillows and blankets		√	√
	Clean control panels (reading lights and air conditioning) and interphone mic		√	√
	Vacuum carpet			If necessary
	Clean cabin crew seats		√	√
	Clean the surface of the inner layer of cabin window glass		√	√



Appendix 1

Operating Procedures for Aircraft Preventative Disinfection

1. Separate rags and mops should be used for aisle, lavatory and galley, and be marked with different colors. Designated personnel should be assigned to each of the aforementioned areas where conditions allow.

2. During disinfection, surfaces should be rubbed using rags soaked with disinfectant, and after a period of reaction, a regular cleaning process should be carried out to avoid erosive effect on cabin component due to long time exposure to the disinfectant.

3. Disinfectant should be sprayed onto cabin floor from the front to the back, followed by disinfection of key areas. Once cabin disinfection is finished, disinfectant should be sprayed onto cabin floor again from the back to the front.

4. Key areas should be disinfected in the following order:

4.1 Aisle: Overhead bins, reading lights, air outlets, sidewall panels, windows, seats (tray tables, armrests, passenger control units, decorative panels), lockers/closets, bulkheads, magazine racks and cabin attendant seats.

4.2 Lavatory: Disinfection in lavatory should be progressed from contaminated to clean areas as follows: toilet bowls, waste bins, sinks, wall panels, door surfaces, doorknobs, ashtrays (if installed), and latches.

4.3 Galley: Ovens, water boilers, coffee makers, galley itself, lockers/drawers, and waste bins.

5. Disinfectants

Aircraft cleaning and disinfectant products should be approved by an airworthiness department (refer to <http://www.fccc.org.cn/webs/xhg/list.aspx?classid=0202> for products list, same below) to avoid corrosion to aircraft components. Given the current epidemic development and information available, the following disinfectants are recommended to be used for wiping disinfection, at a concentration set out in product user manual.

As far as preventative disinfection is concerned, it is recommended to use compound quaternary ammonium salt, double-chain quaternary ammonium salt, hydrogen peroxide or chlorine-containing disinfectant. For hydrogen peroxide, concentration should be no higher than 3%, with a reaction time of 20 minutes; effective concentration of chlorine should be within the range of 250mg/L-500mg/L, with a reaction time of 10 minutes.



Appendix 2

Operating Procedures for Aircraft Concurrent Disinfection

Concurrent aircraft disinfection should follow the requirements in *Emergency Medical Equipment Installation and Training for Large Transport Aircraft* (AC-121-102R1 issued by CAAC).

The following disinfection procedures should be followed:

1. Wearing personal protection equipment.
2. Preparing disinfectant: Putting one surface disinfection tablet into 250-500ml clean water to make a 1:500-1000 disinfectant.
3. Covering the respiratory secretions, blood, vomit, excretions and other contaminants evenly with absorbent disinfectant for 3~5 min to enable them to be solidified.
4. Shoveling the coagulated contaminants with portable pickup shovels into biohazard waste bags.
5. Sterilizing twice the contaminated area with pre-prepared disinfectant, making sure disinfectant stays on the contaminated surface for 3-5 minutes, then washing the area twice with clean water before drying the area with towels. Putting those towels and other used disinfecting products into biohazard waste bags.
6. Disinfecting hands before removing protections in the following order: taking off protective suits (aprons), gloves, applying skin disinfection wipe for hand disinfection; then taking off goggles, facial masks, and finally applying skin disinfection wipe to clean hands and other parts of the body that may have been exposed to contaminants.
7. Putting all used protection gears and contaminated items into biohazard waste bags, sealing the bags, and sticking a "Biohazard Waste" label close to the seal.
8. Keeping the sealed biohazard waste bags in a proper place temporarily to prevent them from missing, being damaged or contaminating meals on board.
9. Informing relevant ground handling agents at the destination to make preparation as required.



Appendix 3

Operating Procedures for Aircraft Terminal Disinfection

1. Aircraft Cabin Terminal Disinfection

1.1 After all occupants disembark the aircraft, closing cabin doors, and setting the air conditioner to its maximum capacity to allow at least one complete cycle of ventilation in the cabin area.

1.2 Once the ventilation is over, the sitting area of the passengers with suspicious symptoms and lavatory should be disinfected before proceeding with the all-encompassing terminal disinfection from periphery to center and from top to bottom.

1.3 After disinfection, the passenger cabin should be cleaned in accordance with the post-flight cleaning requirements.

1.4 For a stopover flight carrying suspected cases, as a first move, its sitting areas should be disinfected during the stopover, and after the flight finishes, a terminal disinfection shall be conducted covering the whole cabin.

2. Aircraft Cargo Hold Terminal Disinfection

2.1 When animal remains or suspicious contaminants of a contagious nature are found in the cargo hold, the contaminated area in which the animal remains or the contaminants were should be disinfected and cleaned as the first step, followed by a thorough disinfection of the remaining areas of the cargo hold.

2.2 All-encompassing spray disinfection should be conducted. Disinfection should be performed from upwind to downwind and from top to bottom.

2.3 Before disinfecting the inside area of the cargo hold, spraying around the door, closing the door, entering into the cargo hold, and spraying on the floor while moving forward till the whole floor is sprayed before disinfecting other areas of the cargo hold.

2.4 Disinfecting the ceiling of the cargo hold by spraying disinfectant from left to right and vice versa, and then spraying the cargo hold wall from top to bottom. While disinfecting the ceiling and the wall, the amount of disinfectant sprayed should not exceed the amount of the liquid that can be absorbed (the maximum amount of disinfectant the surface can absorb).

2.5 Upon completion, disinfecting the cargo hold floor once again by spraying while moving backward. After returning to the ground along the ladder, spraying the ladder.

3. Disinfectants

Aircraft cleaning and disinfectant products should be approved by an airworthiness



department. During terminal disinfection, the passenger cabin should be wiped while the cargo hold should be sprayed with disinfectant. Liquid concentration should be in line with what's specified in product use manual.

It is recommended to use hydrogen peroxide or chlorine-containing disinfectant for terminal disinfection. The concentration of hydrogen peroxide should be the same as that used in preventive disinfection, and the effective concentration of chlorine should be 1000mg/L, for 30 minutes. Air conditioning system should be turned off during disinfection, and the passenger cabin or cargo hold should be fully ventilated after disinfection.