Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis

Montréal, Canada
13 March 2020
• Introduction and Background

• Scenario Analysis: **Mainland China**

• Scenario Analysis: **Hong Kong SAR of China and Macao SAR of China**

• Summary of Scenario Analysis and Additional Estimates: **China**

• Scenario Analysis: **Republic of Korea**

• Scenario Analysis: **Italy**

• Scenario Analysis: **Iran (Islamic Republic of)**

• Preliminary Analysis: **Japan and Singapore**

• Preliminary Analysis: **Transatlantic between United States and Schengen Area**
Estimated impact of COVID-19 outbreak on scheduled international passenger traffic during 1Q 2020 compared to originally-planned:

• **China (including Hong Kong/Macao SARs):** 42 to 43% seat capacity reduction, 24.8 to 28.1 million passenger reduction, USD 6.0 to 6.9 billion loss of gross operating revenues of airlines

• **Republic of Korea:** 27% seat capacity reduction, 6.1 to 6.6 million passenger reduction, USD 1.3 to 1.4 billion loss of gross operating revenues of airlines

• **Italy:** 21% seat capacity reduction, 5.5 to 6.1 million passenger reduction, USD 0.7 billion loss of gross operating revenues of airlines

• **Iran (Islamic Republic of):** 25% seat capacity reduction, 580,000 to 630,000 passenger reduction, USD 92 to 100 million loss of gross operating revenues of airlines

*Coronavirus Disease 2019 (COVID-19) Situation Report by WHO*
Global capacity share of 4 States dropped from 23% in January to 9% in March 2020

Source: ICAO estimates based on OAG, Routes Online and airline websites
4 States have represented a significant portion of international capacity reduction in 1Q 2020

Source: ICAO estimates based on OAG, Routes Online and airline websites
Introduction and Background
Air traffic has been vulnerable to external factors including disease outbreaks.
What can we learn from past experience?

SARS, Aviation flu and MERS

History shows that SARS has the most serious impact on traffic. At the height of the outbreak (May 2003), monthly RPKs of Asia-Pacific airlines were 35% lower than their pre-crisis levels. Overall in 2003, Asia-Pacific airlines lost 8% of annual RPKs and $6 billion of revenues.

Source: IATA Economics’ Chart of the Week (24 January 2020)
Total number of passenger moved through Chinese airports
2003-2018
(million of passengers)

Chinese international traffic more than doubled since 2003 SARS spread

Passengers move to/from Chinese airports
2003 vs 2018

Annual average growth rate: \( \uparrow 9.6\% \)

Source: ICAO-ACI Airport traffic data
Chinese economic size quadrupled since 2003 but growth rate slowed down.

GDP of China (constant 2010 USD, trillion)

GDP Annual Growth of China (%)

Source: World Bank Group
China is more integrated in the global economy

Source: OECD Interim Economic Outlook dated 2 March 2020
The drop in Chinese travellers will hit hard

Travel services to China and Hong Kong-China, as a share of GDP

2018

Source: OECD Interim Economic Outlook dated 2 March 2020
Air connectivity of China in terms of O-D passenger movement

Major international air traffic originating from People's Republic of China in 2018

Source: ICAO-ICM MIDT data
Air connectivity of Wuhan airport in terms of O-D passenger movement

Major air traffic originating from Wuhan Tianhe International Airport in 2018

Source: ICAO-ICM MIDT data
COVID-19 outbreak caused a substantial setback in flight bookings for Chinese New Year

Chinese air arrivals in worldwide regions for Chinese New Year, before vs one week after the travel restrictions

Source: forwardkeys.com
Flight cancellation has exceeded actual operations since 31 January 2020

Note: The above includes a) international from mainland China, Hong Kong SAR of China, Macao SAR of China, Taiwan, Province of China; b) domestic within mainland China, and c) regional between mainland China and Hong Kong SAR, Macao SAR and Taiwan Province
This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
“International” refers to scheduled international passenger services from/to mainland China excluding:

- scheduled passenger services between mainland China and Hong Kong Special Administrative Region (SAR) of China, Macao SAR of China and Taiwan, Province of China; and
- scheduled international passenger services from/to Hong Kong SAR, Macao SAR of China and Taiwan, Province of China

“Regional” refers to scheduled passenger services:

- between mainland China and Hong Kong SAR of China
- between mainland China and Macao SAR of China; and
- between mainland China and Taiwan, Province of China
Number of seats offered by airlines (monthly, 2019)

Capacity share 2019

• 45%: International by Chinese carriers
• 37%: International by foreign carriers
• 9% Regional (mainland China - Hong Kong SAR)
• 3% Regional (mainland China - Macao SAR)
• 7% Regional (mainland China - Taiwan Province)

Source: OAG Scheduled data
Number of seats offered by airlines
(1Q 2020 originally-planned)

Capacity share 1Q 2020

- 48%: International by Chinese carriers
- 36%: International by foreign carriers
- 7% Mainland China - Hong Kong SAR
- 3% Mainland China - Macao SAR
- 6% Mainland China - Taiwan Province

Source: OAG Scheduled data
Over 130 airlines reduced international services or cancelled all operations from/to mainland China

**International (136)**

- Aero Mongolia*
- Air Algerie*^*
- Air Astana*
- Air Busan
- Air Canada*
- Air China
- Air Company SCAT*
- Air France*
- Air India
- Air Koryo*
- Air Madagascar*
- Air Mauritius*
- Air New Zealand*
- Air Seoul, Inc*
- AirAsia
- Airasia X
- All Nippon Airways
- American Airlines*
- Asiana Airlines
- Austrian Airlines*
- Azerbaijan Airlines*
- AZUR air*
- Bangkok Airways*
- Batik Air
- Beijing Capital Airlines
- British Airways*
- Cambodia Airways Co. Ltd
- Cambodia Angkor Air*
- Cebu Pacific Air*
- Chengdu Airlines
- China Eastern Airlines
- China Express Airlines
- China Southern Airlines
- China United Airlines
- China West Air*
- Chongqing Airlines*
- Citilink Indonesia
- Delta Air Lines*
- Donghai Airlines*
- Eastar Jet
- Egyptair**
- El Al Israel Airlines*
- Emirates
- Ethiopian Airlines
- Etihad Airways
- Finnair*
- Garuda Indonesia*
- Guangxi Beibu Gulf Airlines
- Hainan Airlines
- Hebei Airlines*
- Himalaya Airlines*
- Iberia*
- IndiGo*
- IrAero*
- Iraqi Airways*
- Japan Airlines
- JC Cambodia Intl Airlines
- Jeju Airlines
- Jetstar Asia*
- Jetstar Japan*
- Jetstar Pacific Airlines*
- Jin Air*
- Juneyao Airlines
- Kenya Airways*
- KLM-Royal Dutch Airlines*
- Korean Air
- Kumming Airlines
- Lanmei Airlines
- Lao Airlines
- Lion Air
- LOT - Polish Airlines*
- Lucky Air Co. Ltd.
- Lufthansa German Airlines*
- Mahan Air*
- Malaysia Airlines
- Malindo Airways
- MIAT - Mongolian Airlines*
- Myanmar Airways Intl*
- Myanmar National Airlines*
- Neos Air*
- Nok Air*
- NokScoot Airlines Co Ltd*
- NordStar*
- Okay Airways*
- Oman Air*
- Pakistan Intl Airlines*
- PAL Express*
- Peach Aviation Limited*
- Pegas Fly*
- Philippine Airlines*
- Philippine Airlines Inc.*
- Qantas Airways*
- Qatar Airways*
- Qingdao Airlines Co Ltd
- Royal Air Maroc*
- Royal Brunei Airlines*
- Royal Flight Airlines*
- Ruili Airlines
- SAS Scandinavian Airlines*
- Scoot*
- Saudi Arabian Airlines*
- Shandong Airlines
- Shanghai Airlines
- Shenzhen Airlines
- Siberia Airlines*
- Sichuan Airlines
- SilkAir
- Singapore Airlines
- Sky Angkor Airlines
- Somon Air*
- Spring Airlines
- Spring Airlines Japan
- SriLankan Airlines
- SWISS*
- Thai Air Asia X
- Thai AirAsia
- Thai Airways International
- Thai Lion Air
- Thai Smile Airways*
- Tianjin Airlines*
- Tibet Airlines*
- Turkish Airlines*^*
- Turkmenistan Airlines*
- T'way Air*
- Ukraine Inter Airlines*
- United Airlines*
- Ural Airlines
- Urumqi Airlines*
- US-Bangla Airlines
- Shanghai Airlines
- Vietnam Airlines*
- Virgin Atlantic Airways*
- Xiamen Airlines Company
- Yakutia*
- Zhejiang Loong Airlines

**Regional (25)**

- Air Algerie
- Air China
- Air Macau
- Cathay Dragon
- Cathay Pacific Airways
- China Airlines
- China Eastern Airlines
- China Southern Airlines
- Chongqing Airlines
- Hainan Airlines
- HK Express
- Hong Kong Airlines
- Juneyao Airlines
- Mandarin Airlines
- Shandong Airlines
- Shenzhen Airlines
- Sichuan Airlines
- Tigerair Taiwan Co. Ltd
- Uni Airways
- Xiamen Airlines Company

---

**Source:** Routes Online, OAG and airline websites (as of 13 March 2020)

Announced since late January 2020; Duration varies

*: Airlines with all service cancelled

**^:** Airlines with all service cancelled but gradual resumption
Scenario analysis of COVID-19 outbreak impact for 1Q 2020

• Baseline (hypothetical situation without COVID-19 outbreak)
  – Seat capacity: used "originally-planned" winter schedule
  – Load factor: used 2018 actual results of airlines (average)

• Scenario 1 (mild)
  – Seat capacity: estimated by airlines' schedule changes
  – Load factor: used 2018 actual results of airlines except Hong Kong SAR of China

• Scenario 2 (severe)
  – Seat capacity in January and February: estimated by airlines' schedule changes
  – Seat capacity in March: assumed summer schedules not starting from 29 March
  – Load factor: 12 – 22 and 7 – 17 percentage points lower in February and March from January, respectively
## Scenario analysis: Assumptions

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Baseline</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat capacity reduction from originally-planned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger load factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>0%</td>
<td>78%</td>
<td>-1%</td>
<td>78%</td>
<td>-1%</td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td>0%</td>
<td>80%</td>
<td>0%</td>
<td>80%</td>
<td>0%</td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td>0%</td>
<td>80%</td>
<td>0%</td>
<td>70%</td>
<td>0%</td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td>0%</td>
<td>80%</td>
<td>-1%</td>
<td>80%</td>
<td>-1%</td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>0%</td>
<td>80%</td>
<td>-1%</td>
<td>80%</td>
<td>-1%</td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Baseline: 10% seat capacity increase compared to 1Q 2019

A total of YoY 10% seat capacity increase originally planned for 1Q 2020 despite the reduction of capacity between mainland China and Hong Kong SAR and Taiwan Province.
Scenarios 1 & 2: 46% seat capacity reduction from Baseline

Scenario 1: for 1Q 2020 a total of 40% reduction compared to 1Q 2019 and 46% reduction from Baseline

Scenario 2: for 1Q 2020 a total of 41% reduction compared to 1Q 2019 and 46% reduction from Baseline

Source: ICAO estimates
16.3 to 18.0 million “international” passenger reduction in 1Q 2020 compared to Baseline.

Scenario 1
16.3 million passenger reduction

Scenario 2
18.0 million passenger reduction

Source: ICAO estimates
3.4 to 3.7 million “regional” passenger reduction in 1Q 2020 compared to Baseline

Source: ICAO estimates
Approx. USD 4.8 to 5.3 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

ScENARIO 1: USD 4.8 billion reduction

- International (Chinese carriers): calculated with an average fare of USD 250 per passenger based on traffic/financial reports of CA, CZ and MU;
- International (Foreign carriers): assumed 15% higher average fare than Chinese carriers;
- Regional: calculated with an average fare of USD 135 per passenger based on traffic/financial reports of CA, CZ and MU

ScENARIO 2: USD 5.3 billion reduction

Source: ICAO estimates
The preliminary estimates indicate the impact in terms of scheduled international passenger traffic from/to mainland China (including between mainland China and Hong Kong SAR of China, Macao SAR of China and Taiwan, Province of China) during 1Q 2020 compared to originally-planned:

- Overall reduction of **46% of seats offered by airlines**
- Overall reduction of **19.7 to 21.7 million passengers**
- Approx. **USD 4.8 to 5.3 billion potential loss** of gross operating revenues of airlines

### Summary of estimated impact in 1Q 2020

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Estimated Impact on</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Number of seats offered by airlines (000)</td>
<td>Number of passengers (000)</td>
<td>Gross operating revenues of airlines (USD, million)</td>
</tr>
<tr>
<td></td>
<td>Scenario 1</td>
<td>Scenario 2</td>
<td>Scenario 1</td>
<td>Scenario 2</td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>-11,400</td>
<td>-11,600</td>
<td>-8,900</td>
<td>-10,100</td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td>-9,200</td>
<td>-9,300</td>
<td>-7,400</td>
<td>-7,900</td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td>-1,900</td>
<td>-1,900</td>
<td>-1,700</td>
<td>-1,800</td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td>-700</td>
<td>-700</td>
<td>-600</td>
<td>-600</td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>-1,500</td>
<td>-1,500</td>
<td>-1,200</td>
<td>-1,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-24,700</strong></td>
<td><strong>-25,100</strong></td>
<td><strong>-19,700</strong></td>
<td><strong>-21,700</strong></td>
</tr>
</tbody>
</table>

**Source:** ICAO estimates
Scenario Analysis:
Hong Kong SAR of China and Macao SAR of China

This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
• “Hong Kong International” refers to scheduled international passenger services from/to Hong Kong Special Administrative Region (SAR) of China excluding:
  – scheduled passenger services between Hong Kong SAR of China and mainland China, Macao SAR of China and Taiwan, Province of China

• “Macao International” refers to scheduled international passenger services from/to Macao SAR of China excluding:
  – scheduled passenger services between Macao SAR of China and mainland China, Hong Kong SAR of China and Taiwan, Province of China

• “Cross-Strait” refers to scheduled passenger services among Hong Kong SAR of China, Macao SAR of China and Taiwan, Province of China excluding:
  – “Regional” already included in the mainland China analysis
Number of seats offered by airlines (monthly, 2019)

Capacity share 2019
- 78%: Hong Kong International
- 6%: Macao International
- 16%: Cross-Strait

Source: OAG Scheduled data
Number of seats offered by airlines (1Q 2020 originally-planned)

- 76%: Hong Kong International
- 7%: Macao International
- 17%: Cross-Strait

Airlines originally planned to reduce seat capacity slightly due to the impact of Hong Kong protests and the continued trade tension.

Source: OAG Scheduled data
Some 70 airlines cancelled all services or reduced services from/to Hong Kong SAR and Macao SAR

<table>
<thead>
<tr>
<th>Country</th>
<th>Airlines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hong Kong International (66)</strong></td>
<td>Egyptair, Emirates, Ethiopian Airlines, Etihad Airways*, Lufthansa German Airlines, Malaysia Airlines, Malindo Airways, MIAT - Mongolian Airlines*, Myanmar National Airlines, Peach Aviation Limited, Philippine Airlines*, Philippines AirAsia Inc.<em>, Scoot, Thai AirAsia, T'way Air</em></td>
</tr>
<tr>
<td><strong>Air Astana</strong></td>
<td>El Al Israel Airlines*</td>
</tr>
<tr>
<td><strong>Air Busan</strong></td>
<td>Air India*</td>
</tr>
<tr>
<td><strong>Air Canada</strong></td>
<td>Fiji Airways</td>
</tr>
<tr>
<td><strong>Air France</strong></td>
<td>Finnair</td>
</tr>
<tr>
<td><strong>Air India</strong></td>
<td>Garuda Indonesia</td>
</tr>
<tr>
<td><strong>Air Mauritius</strong></td>
<td>HK Express</td>
</tr>
<tr>
<td><strong>Air Niugini</strong></td>
<td>Hong Kong Airlines</td>
</tr>
<tr>
<td><strong>Air Seoul, Inc</strong></td>
<td>IndiGo*</td>
</tr>
<tr>
<td><strong>AirAsia</strong></td>
<td>Japan Airlines</td>
</tr>
<tr>
<td><strong>All Nippon Airways</strong></td>
<td>Jeju Airlines</td>
</tr>
<tr>
<td><strong>American Airlines</strong></td>
<td>Jetstar Asia*</td>
</tr>
<tr>
<td><strong>Asiana Airlines</strong></td>
<td>Jetstar Japan*</td>
</tr>
<tr>
<td><strong>Bangkok Airways</strong></td>
<td>Jetstar Pacific Airlines*</td>
</tr>
<tr>
<td><strong>British Airways</strong></td>
<td>KLM-Royal Dutch Airlines</td>
</tr>
<tr>
<td><strong>Cathay Dragon</strong></td>
<td>KLM-Royal Dutch Airlines</td>
</tr>
<tr>
<td><strong>Cathay Pacific Airways</strong></td>
<td>Korean Air*</td>
</tr>
<tr>
<td><strong>Cebu Pacific Air</strong></td>
<td>Lanmei Airlines*</td>
</tr>
<tr>
<td><strong>Eastar Jet</strong></td>
<td>Lanmei Airlines*</td>
</tr>
</tbody>
</table>

**Macao International (17)**

<table>
<thead>
<tr>
<th>Airlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Busan*</td>
</tr>
<tr>
<td>Air Macau</td>
</tr>
<tr>
<td>AirAsia</td>
</tr>
<tr>
<td>Bamboo Airways*</td>
</tr>
<tr>
<td>Cambodia Airways Co. Ltd*</td>
</tr>
<tr>
<td>Cambodia Angkor Air*</td>
</tr>
<tr>
<td>Cebu Pacific Air*</td>
</tr>
<tr>
<td>Eastar Jet*</td>
</tr>
<tr>
<td>Jeju Airlines</td>
</tr>
<tr>
<td>Jin Air*</td>
</tr>
<tr>
<td>Lanmei Airlines*</td>
</tr>
</tbody>
</table>

Announced since late January 2020; Duration varies

*: Airlines with all service cancelled

^*: Airlines with all service cancelled but gradual resumption

Source: Routes Online, OAG and airline websites (as of 13 March 2020)
Scenario analysis of COVID-19 outbreak impact for 1Q 2020

• Baseline (hypothetical situation without COVID-19 outbreak)
  – Seat capacity: used "originally-planned" winter schedule
  – Load factor: used the same percentage as "International from/to mainland China (Foreign carriers)" and "Regional"

• Scenario 1 (mild)
  – Seat capacity: estimated by airlines' schedule changes
  – Load factor: used the same percentage as Baseline

• Scenario 2 (severe)
  – Seat capacity in January and February: estimated by airlines' schedule changes
  – Seat capacity in March: assumed summer schedules not starting from 29 March
  – Load factor: 22 and 17 percentage points lower in February and March from January, respectively
## Scenario analysis: Assumptions

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Baseline</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seat capacity reduction</td>
<td>Seat capacity reduction</td>
<td>Seat capacity reduction</td>
</tr>
<tr>
<td></td>
<td>from originally-planned</td>
<td>from originally-planned</td>
<td>from originally-planned</td>
</tr>
<tr>
<td></td>
<td>Passenger load factor</td>
<td>Passenger load factor</td>
<td>Passenger load factor</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>International</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Macao International</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>January 2020</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0%</td>
<td>-25%</td>
<td>-25%</td>
</tr>
<tr>
<td>International</td>
<td>80%</td>
<td>80%</td>
<td>58%</td>
</tr>
<tr>
<td>Macao International</td>
<td>0%</td>
<td>-67%</td>
<td>-67%</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>0%</td>
<td>-52%</td>
<td>-52%</td>
</tr>
<tr>
<td>February 2020</td>
<td>80%</td>
<td>80%</td>
<td>58%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0%</td>
<td>-65%</td>
<td>-69%</td>
</tr>
<tr>
<td>International</td>
<td>80%</td>
<td>80%</td>
<td>63%</td>
</tr>
<tr>
<td>Macao International</td>
<td>0%</td>
<td>-78%</td>
<td>-80%</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>0%</td>
<td>-86%</td>
<td>-87%</td>
</tr>
<tr>
<td>March 2020</td>
<td>80%</td>
<td>80%</td>
<td>63%</td>
</tr>
</tbody>
</table>
Baseline:
5% seat capacity reduction compared to 1Q 2019

A total of YoY 5% seat capacity reduction originally planned for 1Q 2020 due to the expectation of continued weak demand for Hong Kong SAR and Taiwan Province.
Scenarios 1 & 2:

33 to 34% seat capacity reduction from Baseline

Scenario 1: for 1Q 2020 a total of 37% reduction compared to 1Q 2019 and 33% reduction from Baseline

Scenario 2: for 1Q 2020 a total of 38% reduction compared to 1Q 2019 and 34% reduction from Baseline

Source: ICAO estimates
5.1 to 6.4 million passenger reduction in 1Q 2020 compared to Baseline

Source: ICAO estimates
Approx. USD 1.2 to 1.6 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

Scenario 1: USD 1.2 billion reduction

Scenario 2: USD 1.6 billion reduction

- Hong Kong International: calculated with an average fare of USD 287.6 per passenger (i.e. almost the same as “International (Foreign carriers)”);
- Macao International: calculated with an average fare of USD 172 per passenger;
- Cross-Strait: calculated with an average fare of USD 135 per passenger (i.e. the same as “Regional”)

Source: ICAO estimates
The preliminary estimates indicate the impact in terms of scheduled international passenger traffic from/to Hong Kong SAR of China and Macao SAR of China, as well as scheduled passenger traffic among Hong Kong SAR of China, Macao SAR of China and Taiwan, Province of China, during 1Q 2020 compared to originally-planned:

- Overall reduction ranging from **33% to 34% of seats offered by airlines**
- Overall reduction of **5.1 to 6.4 million passengers**
- Approx. **USD 1.2 to 1.6 billion potential loss** of gross operating revenues of airlines

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Estimated Impact on</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of seats offered by airlines</td>
</tr>
<tr>
<td></td>
<td>(000)</td>
</tr>
<tr>
<td>Hong Kong International</td>
<td>Scenario 1</td>
</tr>
<tr>
<td>-4,200</td>
<td>-4,400</td>
</tr>
<tr>
<td>Macao International</td>
<td>-600</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>-1,500</td>
</tr>
<tr>
<td>Total</td>
<td>-6,300</td>
</tr>
</tbody>
</table>

*Source: ICAO estimates*
Summary of Scenario Analysis: China
+ Additional Estimates

This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
The direct impact of COVID-19 outbreak is expected to be greater than that caused by SARS in 2003 due to higher scale of flight cancellations and bigger economic size/air travel market of China.

The preliminary estimates indicate the impact in terms of scheduled international passenger traffic from/to China (including Hong Kong SAR of China, Macao SAR of China and cross-strait services from/to Taiwan, Province of China) during 1Q 2020 compared to originally-planned:

- Overall reduction ranging from 42% to 43% of seats offered by airlines
- Overall reduction of 24.8 to 28.1 million passengers
- Approx. USD 6.0 to 6.9 billion potential loss of gross operating revenues of airlines

The above estimates exclude, inter alia, the impact of traffic reduction related to air cargo, Chinese domestic, as well as other international services.

Source: ICAO estimates
55% and 87% of revenue reduction is estimated to be attributed to the loss from Chinese carriers and Asia/Pacific carriers (including Chinese carriers), respectively.

Source: ICAO estimates
## Break-down of estimated impact in 1Q 2020

### Scope of analysis

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of seats offered by airlines (000)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>-11,400</td>
<td>-11,600</td>
<td>-8,900</td>
<td>-10,100</td>
<td>-2,230</td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td>-9,200</td>
<td>-9,300</td>
<td>-7,400</td>
<td>-7,900</td>
<td>-2,120</td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td>-1,900</td>
<td>-1,900</td>
<td>-1,700</td>
<td>-1,800</td>
<td>-230</td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td>-700</td>
<td>-700</td>
<td>-600</td>
<td>-600</td>
<td>-80</td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>-1,500</td>
<td>-1,500</td>
<td>-1,200</td>
<td>-1,300</td>
<td>-160</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>-24,700</td>
<td>-25,100</td>
<td>-19,700</td>
<td>-21,700</td>
<td>-4,820</td>
</tr>
<tr>
<td><strong>Number of passengers (000)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>-11,400</td>
<td>-11,600</td>
<td>-8,900</td>
<td>-10,100</td>
<td>-2,230</td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td>-9,200</td>
<td>-9,300</td>
<td>-7,400</td>
<td>-7,900</td>
<td>-2,120</td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td>-1,900</td>
<td>-1,900</td>
<td>-1,700</td>
<td>-1,800</td>
<td>-230</td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td>-700</td>
<td>-700</td>
<td>-600</td>
<td>-600</td>
<td>-80</td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>-1,500</td>
<td>-1,500</td>
<td>-1,200</td>
<td>-1,300</td>
<td>-160</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>-24,700</td>
<td>-25,100</td>
<td>-19,700</td>
<td>-21,700</td>
<td>-4,820</td>
</tr>
<tr>
<td><strong>Gross operating revenues of airlines (USD, million)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>-2,230</td>
<td>-2,510</td>
<td>-2,120</td>
<td>-2,280</td>
<td></td>
</tr>
<tr>
<td>International from/to mainland China (Foreign carriers)</td>
<td>-230</td>
<td>-240</td>
<td>-80</td>
<td>-90</td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Hong Kong SAR of China</td>
<td>-230</td>
<td>-240</td>
<td>-80</td>
<td>-90</td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Macao SAR of China</td>
<td>-230</td>
<td>-240</td>
<td>-80</td>
<td>-90</td>
<td></td>
</tr>
<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>-230</td>
<td>-240</td>
<td>-80</td>
<td>-90</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>-4,820</td>
<td>-5,300</td>
<td>-1,220</td>
<td>-1,570</td>
<td></td>
</tr>
</tbody>
</table>

### Source

ICAO estimates
The preliminary estimates indicate the impact in terms of scheduled domestic passenger traffic within mainland China during 1Q 2020 compared to originally-planned:

- Overall reduction of **40%** of seats offered by airlines
- Overall reduction of **66.6 to 75.8 million passengers**
- Approx. **USD 6.7 to 7.6 billion potential loss** of gross operating revenues of airlines

### Estimated Impact on Domestic passenger services in mainland China in 1Q 2020

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat capacity</td>
<td>-76,100</td>
<td>-76,100</td>
<td>-66,600</td>
<td>-75,800</td>
<td>-$6,460</td>
<td>-$7,774</td>
</tr>
<tr>
<td>Number of seats offered by airlines (000)</td>
<td>-40%</td>
<td>-40%</td>
<td>-42%</td>
<td>-48%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumption</td>
<td>Load factor is down from 83% (baseline) to 80% for 1Q 2020</td>
<td>Load factor is down from 83% (baseline) to 80% in January 2020, 58% in February 2020 and 65% in March 2020</td>
<td>Calculated with an average fare of USD 97 per passenger based on CANNews.com.cn estimates</td>
<td>Calculated with an average fare of USD 102.5 per passenger based on traffic/financial reports of CA, CZ and MU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Source: ICAO estimates
### Potential loss of revenues from Chinese tourists to top 5 States in 1Q 2020

<table>
<thead>
<tr>
<th>Top 5 States that Chinese traveller had the largest share</th>
<th>Baseline</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Passenger number</td>
<td>Tourism revenue (in million USD)*</td>
<td>Passenger number</td>
</tr>
<tr>
<td>Australia</td>
<td>460,161</td>
<td>446.36</td>
<td>340,318</td>
</tr>
<tr>
<td></td>
<td>Loss</td>
<td>-119,843</td>
<td>-116.25</td>
</tr>
<tr>
<td>France</td>
<td>240,523</td>
<td>233.31</td>
<td>137,867</td>
</tr>
<tr>
<td>Japan</td>
<td>3,181,840</td>
<td>3,086.38</td>
<td>2,167,273</td>
</tr>
<tr>
<td></td>
<td>Loss</td>
<td>-1,014,567</td>
<td>-984.13</td>
</tr>
<tr>
<td>Thailand</td>
<td>2,772,352</td>
<td>2,689.18</td>
<td>1,826,629</td>
</tr>
<tr>
<td></td>
<td>Loss</td>
<td>-945,723</td>
<td>-917.35</td>
</tr>
<tr>
<td>United States</td>
<td>888,102</td>
<td>861.46</td>
<td>505,096</td>
</tr>
<tr>
<td></td>
<td>Loss</td>
<td>-383,006</td>
<td>-371.52</td>
</tr>
</tbody>
</table>

- Data excludes Special Administrative Regions (SAR) of China (Hong Kong SAR and Macao SAR) and Taiwan, Province of China
- Calculated with average international tourism spending of China (USD 970) per tourist reported by UNWTO

Source: ICAO estimates
Scenario Analysis:
Republic of Korea

This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
• Scope: scheduled international passenger services from/to Republic of Korea

• Baseline (hypothetical situation without COVID-19 outbreak)*
  – Seat capacity: used "originally-planned" winter schedule
  – Load factor: 80%

• Scenario 1 (mild)*
  – Seat capacity: estimated by airlines' schedule changes
  – Load factor: used the same percentage as Baseline

• Scenario 2 (severe)*
  – Seat capacity: estimated by airlines' schedule changes
  – Load factor: 10 percentage points lower in March (i.e. 70%)

* Between Republic of Korea and China, Hong Kong SAR and Macao SAR of China: extracted the impacts involving Korea from the respective scenarios of China and Hong Kong/Macao SARs
27% seat capacity reduction in 1Q 2020 from Baseline

COVID-19 has started to impact airline operations from late February 2020 (except China routes)

Source: ICAO estimates
ICAO estimates

6.1 to 6.6 million passenger reduction in 1Q 2020 compared to Baseline

Scenario 1: a total of 6.1 million passenger reduction for 1Q 2020 from Baseline

Scenario 2: a total of 6.6 million passenger reduction for 1Q 2020 from Baseline

Source: ICAO estimates
Approx. USD 1.3 to 1.4 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

Source: ICAO estimates

Scenario 1: USD 1.3 billion reduction

- Between Korea and China including Hong Kong/Macao SARs
- Between Korea and other international destinations (Korean carriers)
- Between Korea and other international destinations (Foreign carriers)

Scenario 2: USD 1.4 billion reduction

- Between Korea and China including Hong Kong SAR: extracted the impact involving Korea from scenarios 1 and 2 of China;
- Other internal destinations: Other internal destinations: calculated with an average fare of USD 287.6 per passenger (ranging from USD 155 to 485 by destination)
Scenario Analysis: Italy

This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
Scenario analysis of COVID-19 outbreak impact for 1Q 2020

- **Scope**: scheduled international passenger services from/to Italy

- **Baseline (hypothetical situation without COVID-19 outbreak)***
  - Seat capacity: used "originally-planned" winter schedule
  - Load factor: 80% (90% for short-haul low-cost carriers)

- **Scenario 1 (mild)***
  - Seat capacity: estimated by airlines' schedule changes
  - Load factor: used the same percentage as Baseline

- **Scenario 2 (severe)***
  - Seat capacity: estimated by airlines' schedule changes
  - Load factor: 10 percentage points lower in March

* Between Italy and China, Hong Kong SAR of China, as well as Republic of Korea: extracted the impacts involving Italy from the respective scenarios of China, Hong Kong SAR and Korea
21% seat capacity reduction in 1Q 2020 from Baseline

COVID-19 has started to impact airline operations from late February 2020 (except China routes)

Source: ICAO estimates
ICAO estimates

Between Italy and China including Hong Kong SAR, Republic of Korea, and Iran (Islamic Republic of) between Italy and other international destinations

5.5 to 6.1 million passenger reduction in 1Q 2020 compared to Baseline

Source: ICAO estimates
• Between Italy and China, Hong Kong SAR and Macao SAR of China, as well as Republic of Korea: extracted the impacts involving Italy from the respective scenarios of China, Hong Kong/Macao SARs and Korea;

• Other internal destinations: calculated with an average fare of USD 180 per passenger (ranging from USD 60 to 485 by destination)

Source: ICAO estimates

Approx. USD 0.7 billion potential loss of airline revenues for 1Q 2020 compared to Baseline
Scenario Analysis:
Iran (Islamic Republic of)

This is a preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
Scenario analysis of COVID-19 outbreak impact for 1Q 2020

- **Scope**: scheduled international passenger services from/to Iran (Islamic Republic of)

- **Baseline (hypothetical situation without COVID-19 outbreak)***
  - Seat capacity: used "originally-planned" winter schedule
  - Load factor: 80%

- **Scenario 1 (mild)***
  - Seat capacity: estimated by airlines' schedule changes
  - Load factor: used the same percentage as Baseline

- **Scenario 2 (severe)***
  - Seat capacity: estimated by airlines' schedule changes
  - Load factor: 10 percentage points lower in March (i.e. 70%)

* Between Iran (Islamic Republic of) and China, as well as Italy: extracted the impacts involving Iran from the respective scenarios of China and Italy
25% seat capacity reduction in 1Q 2020 from Baseline

COVID-19 has started to impact airline operations from late February 2020 (except China routes)

Note: Some capacity change was announced and implemented before COVID-19 outbreak

Source: ICAO estimates
580,000 to 630,000 passenger reduction in 1Q 2020 compared to Baseline

Source: ICAO estimates
Approx. USD 92 to 100 million potential loss of airline revenues for 1Q 2020 compared to Baseline

- Between Italy and China, Italy: extracted the impacts involving Iran from the respective scenarios of China and Italy;
- Other internal destinations: calculated with an average fare of USD 140 per passenger (ranging from USD 105 to 370 by destination)

Source: ICAO estimates
This section contains a very preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
Japan/Singapore reported the second highest confirmed cases till mid-February*

Source: ICAO estimates based on OAG, Routes Online and airline websites

* Coronavirus Disease 2019 (COVID-19) Situation Report by WHO
This section contains a very preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
Potentially impacting on over 4.3 million seats offered by 15,000 flights for the first one month.

The U.S. travel policy may affect approx. 3.6 million passengers for one month.

All flights from/to Italy had been suspended before the travel policy implementation.

Source: OAG Scheduled data and estimates using ICAO-ICM MIDT data
Contact: ECD@icao.int


https://www.icao.int/Security/COVID-19/Pages/default.aspx

http://www.capsca.org/CoronaVirusRefs.html