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

Montréal, Canada
6 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: China
• Scenario Analysis: Republic of Korea
• Scenario Analysis: Italy
• Preliminary Analysis: Iran (Islamic Republic of) and Mongolia
Estimated impact of COVID-19 outbreak on scheduled international passenger traffic during 1Q 2020 compared to originally-planned:

- **China (including Hong Kong/Macao SARs)**: 41 to 42% seat capacity reduction, 23.9 to 27.5 million passenger reduction, USD 5.8 to 6.7 billion loss of gross operating revenues of airlines

- **Republic of Korea**: 24% seat capacity reduction, 5.3 to 6.0 million passenger reduction, USD 1.1 to 1.2 billion loss of gross operating revenues of airlines

- **Italy**: 8% seat capacity reduction, 1.9 to 2.9 million passenger reduction, USD 0.26 to 0.37 billion loss of gross operating revenues of airlines

- **Iran (Islamic Republic of)**: 12% seat capacity reduction, 0.11 million passenger reduction, USD 22 million loss of gross operating revenues of airlines

* February 2020 only
Introduction and Background
Air traffic has been vulnerable to external factors including disease outbreaks.
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.
Chinese international traffic more than doubled since 2003 SARS spread

Total number of passenger moved through Chinese airports 2003-2018
(million of passengers)

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

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.
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

Source: CARNOC.com (retrieved on 1 March 2020)
Scenario Analysis:
Mainland China

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


| Airline Group | Announced since late January 2020; Duration varies |

| Announcement Details | *: Airlines with all service Cancelled | ^: Airlines with all service cancelled but gradual resumption |

Source: Routes Online, OAG and airline websites (as of 6 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 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>
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<tbody>
<tr>
<td></td>
<td>Seat capacity</td>
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<td>reduction from</td>
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<td>Regional between mainland China and Macao SAR of China</td>
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<td>80%</td>
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<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
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<td>-1%</td>
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<td>International from/to mainland China (Chinese carriers)</td>
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<td>-76%</td>
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<td>-64%</td>
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<tr>
<td>Regional between mainland China and Taiwan, Province of China</td>
<td>0%</td>
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<td>80%</td>
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</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: 45% seat capacity reduction from Baseline

Scenario 1: for 1Q 2020 a total of 39% reduction compared to 1Q 2019 and 45% reduction from Baseline

Scenario 2: for 1Q 2020 a total of 40% reduction compared to 1Q 2019 and 45% reduction from Baseline

Source: ICAO estimates
Source: ICAO estimates

15.8 to 17.6 million “international” passenger reduction in 1Q 2020 compared to Baseline
3.4 to 3.7 million “regional” passenger reduction in 1Q 2020 compared to Baseline

Source: ICAO estimates
Approx. USD 4.7 to 5.2 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

**Scenario 1: USD 4.7 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 5.2 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

*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 **45% of seats offered by airlines**
- Overall reduction of **19.3 to 21.4 million passengers**
- Approx. **USD 4.7 to 5.2 billion potential loss** of gross operating revenues of airlines

### Scope of analysis

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Number of seats offered by airlines (000)</th>
<th>Number of passengers (000)</th>
<th>Gross operating revenues of airlines (USD, million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International from/to mainland China (Chinese carriers)</strong></td>
<td>-11,100 -42% -11,300 -43%</td>
<td>-8,600 -42% -9,900 -48%</td>
<td>-2,160 -2,460</td>
</tr>
<tr>
<td><strong>International from/to mainland China (Foreign carriers)</strong></td>
<td>-9,000 -46% -9,200 -47%</td>
<td>-7,200 -46% -7,800 -50%</td>
<td>-2,070 -2,240</td>
</tr>
<tr>
<td><strong>Regional between mainland China and Hong Kong SAR of China</strong></td>
<td>-1,900 -49% -1,900 -49%</td>
<td>-1,700 -55% -1,800 -58%</td>
<td>-230 -240</td>
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<tr>
<td><strong>Regional between mainland China and Macao SAR of China</strong></td>
<td>-700 -44% -700 -45%</td>
<td>-500 -44% -600 -50%</td>
<td>-70 -80</td>
</tr>
<tr>
<td><strong>Regional between mainland China and Taiwan, Province of China</strong></td>
<td>-1,500 -46% -1,500 -47%</td>
<td>-1,200 -46% -1,300 -52%</td>
<td>-160 -180</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-24,100 -45% -24,600 -45%</td>
<td>-19,300 -45% -21,400 -50%</td>
<td>-4,690 -5,210</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)

Capacity share 1Q 2020
- 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
### Hong Kong International (64)

- Aeroflot Russian Airlines
- Air Astana
- Air Busan*
- Air Canada
- Air France
- Air India
- Air Mauritius*
- Air Niugini
- Air Seoul, Inc
- AirAsia
- All Nippon Airways
- American Airlines*
- Asiana Airlines
- Bangkok Airways
- British Airways
- Cathay Dragon
- Cathay Pacific Airways
- Cebu Pacific Air**
- Eastar Jet
- Egyptair
- El Al Israel Airlines*
- Emirates
- Ethiopian Airlines
- Etihad Airways*
- EZNIS AIRWAYS LLC*
- Fiji Airways
- Finnair
- Garuda Indonesia
- HK Express
- Hong Kong Airlines
- IndiGo*
- Japan Airlines
- Jeju Airlines
- Jetstar Asia*
- Jetstar Japan*
- Jetstar Pacific Airlines*
- KLM-Royal Dutch Airlines
- Korean Air*
- Lanmei Airlines*
- Lufthansa German Airlines
- Malaysia Airlines
- MIAT - Mongolian Airlines*
- Myanmar National Airlines
- Peach Aviation Limited
- Philippine Airlines*
- Philippines AirAsia Inc.*
- Qantas Airways
- Qatar Airways
- Royal Brunei Airlines
- Royal Jordanian
- SAS Scandinavian Airlines*
- Scoot
- Siberia Airlines*
- Singapore Airlines
- South African Airways*
- SWISS
- Thai Airways International
- Turkish Airlines
- T'way Air
- United Airlines*
- Vietjet
- Vietnam Airlines
- Virgin Atlantic Airways
- Virgin Australia Intl*
- Cross-Strait (9)
- Air Macau
- Cathay Dragon
- Cathay Pacific Airways
- China Airlines
- EVA Airways
- HK Express
- Hong Kong Airlines
- Mandarin Airlines*
- Tigerair Taiwan Co. Ltd*
- Scoot
- Thai AirAsia
- T'way Air*
- Vietnam Airlines*

**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 6 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>
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<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 from originally-planned</td>
<td>Passenger load factor</td>
<td>Seat capacity reduction from originally-planned</td>
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<tr>
<td><strong>January 2020</strong></td>
<td></td>
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<tr>
<td>Hong Kong International</td>
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<td>0%</td>
</tr>
<tr>
<td>Macao International</td>
<td>0%</td>
<td>80%</td>
<td>0%</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>0%</td>
<td>80%</td>
<td>1%</td>
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<td><strong>February 2020</strong></td>
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<tr>
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<td>0%</td>
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<td>-25%</td>
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<tr>
<td>Macao International</td>
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<td>80%</td>
<td>-67%</td>
</tr>
<tr>
<td>Cross-Strait</td>
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<td>80%</td>
<td>-52%</td>
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<td><strong>March 2020</strong></td>
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<td>-55%</td>
</tr>
<tr>
<td>Macao International</td>
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<td>80%</td>
<td>-75%</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>0%</td>
<td>80%</td>
<td>-83%</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.

Impact of Hong Kong protests

Source: OAG scheduled data
Scenarios 1 & 2: 31 to 32% seat capacity reduction from Baseline

Scenario 1: for 1Q 2020 a total of 34% reduction compared to 1Q 2019 and 31% reduction from Baseline

Scenario 2: for 1Q 2020 a total of 35% reduction compared to 1Q 2019 and 32% reduction from Baseline

Source: ICAO estimates
4.7 to 6.1 million passenger reduction in 1Q 2020 compared to Baseline

**Scenario 1:** a total of 4.7 million passenger reduction for 1Q 2020 from Baseline

**Scenario 2:** a total of 6.1 million passenger reduction for 1Q 2020 from Baseline

*Source: ICAO estimates*
Approx. USD 1.1 to 1.5 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

Scenario 1: USD 1.1 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”)

Scenario 2: USD 1.5 billion reduction

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 **31% to 32% of seats offered by airlines**
- Overall reduction of **4.7 to 6.1 million passengers**
- Approx. **USD 1.1 to 1.5 billion potential loss** of gross operating revenues of airlines

### Estimated Impact on

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Number of seats offered by airlines (000)</th>
<th>Number of passengers (000)</th>
<th>Gross operating revenues of airlines (USD, million)</th>
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<tbody>
<tr>
<td></td>
<td>Scenario 1</td>
<td>Scenario 2</td>
<td>Scenario 1</td>
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<tr>
<td>Hong Kong International</td>
<td>-3,700</td>
<td>-3,900</td>
<td>-3,000</td>
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<tr>
<td>Macao International</td>
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<td>-600</td>
<td>-500</td>
</tr>
<tr>
<td>Cross-Strait</td>
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<td>-1,500</td>
<td>-1,200</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>-5,800</strong></td>
<td><strong>-6,100</strong></td>
<td><strong>-4,700</strong></td>
</tr>
</tbody>
</table>

Source: ICAO estimates
Summary of Scenario Analysis: China

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 41% to 42% of seats offered by airlines
- Overall reduction of 23.9 to 27.5 million passengers
- Approx. USD 5.8 to 6.7 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
Break-down of revenue reduction by region of air carrier registration in 1Q 2020

55% and 85% 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

<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>
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<tr>
<td>Number of seats offered by airlines (000)</td>
<td>-11,100</td>
<td>-11,300</td>
<td>-8,600</td>
<td>-9,900</td>
<td>-2,160</td>
<td>-2,460</td>
</tr>
<tr>
<td>International from/to mainland China (Chinese carriers)</td>
<td>-11,100</td>
<td>-11,300</td>
<td>-8,600</td>
<td>-9,900</td>
<td>-2,160</td>
<td>-2,460</td>
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<tr>
<td>International from/to mainland China (Foreign carriers)</td>
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<td>-7,800</td>
<td>-2,070</td>
<td>-2,240</td>
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<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>
<td>-240</td>
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<td>Regional between mainland China and Macao SAR of China</td>
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<td>-700</td>
<td>-500</td>
<td>-600</td>
<td>-70</td>
<td>-80</td>
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<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>
<td>-180</td>
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<tr>
<td><strong>Sub-total</strong></td>
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<td>-24,600</td>
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</tr>
<tr>
<td>Number of passengers (000)</td>
<td>-11,100</td>
<td>-11,300</td>
<td>-8,600</td>
<td>-9,900</td>
<td>-2,160</td>
<td>-2,460</td>
</tr>
<tr>
<td>Hong Kong International</td>
<td>-3,700</td>
<td>-3,900</td>
<td>-3,000</td>
<td>-4,200</td>
<td>-860</td>
<td>-1,220</td>
</tr>
<tr>
<td>Macao International</td>
<td>-600</td>
<td>-600</td>
<td>-500</td>
<td>-600</td>
<td>-90</td>
<td>-100</td>
</tr>
<tr>
<td>Cross-Strait</td>
<td>-1,500</td>
<td>-1,500</td>
<td>-1,200</td>
<td>-1,300</td>
<td>-160</td>
<td>-180</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>-5,800</td>
<td>-6,100</td>
<td>-4,700</td>
<td>-6,100</td>
<td>-1,100</td>
<td>-1,490</td>
</tr>
<tr>
<td>Gross operating revenues of airlines (USD, million)</td>
<td>-11,100</td>
<td>-11,300</td>
<td>-8,600</td>
<td>-9,900</td>
<td>-2,160</td>
<td>-2,460</td>
</tr>
<tr>
<td>Hong Kong International</td>
<td>-3,700</td>
<td>-3,900</td>
<td>-3,000</td>
<td>-4,200</td>
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<td>-1,200</td>
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<td>-160</td>
<td>-180</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>-5,800</td>
<td>-6,100</td>
<td>-4,700</td>
<td>-6,100</td>
<td>-1,100</td>
<td>-1,490</td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td>-29,900</td>
<td>-30,600</td>
<td>-23,900</td>
<td>-27,500</td>
<td>-5,800</td>
<td>-6,700</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 76.3 million passengers**
- **Approx. USD 6.8 to 7.8 billion potential loss of gross operating revenues of airlines**

### Estimated Impact on

<table>
<thead>
<tr>
<th>Scope of analysis</th>
<th>Estimated Impact on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of seats offered by airlines (000)</td>
<td>Number of Passengers (000)</td>
</tr>
<tr>
<td>Scenarios</td>
<td>Scenario 1</td>
</tr>
<tr>
<td>Domestic within mainland China</td>
<td>-76,100</td>
</tr>
</tbody>
</table>

### Assumption

- **Seat capacity is reduced by 3% in January 2020 and 60% in February and March 2020 from the originally-planned schedules (baseline)**
- **Load factor is down from 83% (baseline) to 80% for 1Q 2020**
- **Load factor is down from 83% (baseline) to 80% in January 2020, 58% in February 2020 and 63% in March 2020**

**Calculated with an average fare of USD 102.5 per passenger based on traffic/financial reports of CA, CZ and MU**

**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>-</td>
<td>-119,843</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>-</td>
<td>-1,014,567</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>-</td>
<td>-945,723</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>-</td>
<td>-383,006</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.
Scenario analysis of COVID-19 outbreak impact for 1Q 2020

• **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 Republic of Korea from the respective scenarios of China and Hong Kong/Macao SARs
COVID-19 has started to impact airline operations from late February 2020 (except China routes).

ICAO estimates a 24% seat capacity reduction in 1Q 2020 from Baseline.

Source: ICAO estimates
ICAO estimates

5.3 to 6.0 million passenger reduction in 1Q 2020 compared to Baseline

Scenario 1: a total of 5.3 million passenger reduction for 1Q 2020 from Baseline

Scenario 2: a total of 6.0 million passenger reduction for 1Q 2020 from Baseline

Source: ICAO estimates
Approx. USD 1.1 to 1.2 billion potential loss of airline revenues for 1Q 2020 compared to Baseline

Scenario 1: USD 1.1 billion reduction
Scenario 2: USD 1.2 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)

- 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)

Source: ICAO estimates
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%

• 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, as well as Republic of Korea: extracted the impacts involving Italy from the respective scenarios of China, Hong Kong/Macao SARs and Korea
8% 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
Between Italy and China including Hong Kong SAR, Republic of Korea, and Iran (Islamic Republic of)

1.9 to 2.9 million passenger reduction in 1Q 2020 compared to Baseline

**Source:** ICAO estimates
Approx. USD 260 to 370 million potential loss of airline revenues for 1Q 2020 compared to Baseline

Scenario 1: USD 260 million reduction

Scenario 2: USD 370 million reduction

- 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 287.6 per passenger (ranging from USD 60 to 485 by destination)

Source: ICAO estimates
Preliminary Analysis:
Iran (Islamic Republic of)
Mongolia

This section contains a very preliminary analysis. Figures and estimates herein will be updated with the situation evolving and more information available.
12% seat capacity reduction from originally-planned level in February 2020 due to COVID-19

-6%: Iranian carriers
-25%: Foreign carriers

*: Capacity change was announced and implemented before COVID-19 outbreak

Source: OAG Scheduled data and ICAO estimates
International passenger services from/to Iran (Islamic Republic of) in Feb 2020

0.11 million passenger reduction in February 2020 compared to originally-planned due to COVID-19

- From/to mainland China: extracted the impact involving Republic of Korea from scenarios 1 and 2;
- Other internal destinations: assumed 80% load factor

Source: ICAO estimates
International passenger services from/to Iran (Islamic Republic of) in Feb 2020

USD 22 million potential loss of airline revenues in February 2020 compared to originally-planned due to COVID-19

- From/to mainland China: extracted the impact involving Republic of Korea from scenarios 1 and 2;
- Other internal destinations: calculated with an average fare of USD 160 per passenger

*: Capacity change was announced and implemented before COVID-19 outbreak
42% seat capacity reduction from originally-planned level in February 2020

-53%: Mongolian carriers
-59%: Chinese carriers
-19%: Korean carriers
-2%: Other foreign carriers

Source: OAG Scheduled data and ICAO estimates
34,000 passenger reduction in February 2020 compared to originally-planned

- From/to mainland China: extracted the impact involving Mongolia from scenarios 1 and 2;
- From/to Republic of Korea and other internal destinations: assumed 80% load factor

Source: ICAO estimates
ICAO estimates

International passenger services from/to Mongolia in Feb 2020

USD 6.1 million potential loss of airline revenues in February 2020 compared to originally-planned

• From/to mainland China and Hong Kong SAR: extracted the impact involving Mongolia from scenarios 1 and 2;

• From/to Republic of Korea and other internal destinations: calculated with an average fare of USD 135 to 155 per passenger

Source: ICAO estimates
– Arrangement for the prevention and Management of Public Health Events in Civil Aviation (CAPSCA)
  • https://www.capsca.org/CoronaVirusRefs.html

– Aviation and COVID-19
  • https://www.icao.int/Security/COVID-19/Pages/default.aspx

– Updated analysis of the effects of the Novel Coronavirus (COVID-19) on air transport