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

Montréal, Canada
29 April 2020
Air Transport Bureau

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Economic Impact in Brief

Figures and estimates herein is subject to substantial changes, and will be updated with the situation evolving and more information available.

Estimated results in brief

The latest estimates indicate that the possible COVID-19 impact on scheduled international passenger traffic for the full year 2020, compared to Baseline (business as usual, originally-planned), would be:

V-shaped path (Scenario 1: a first sign of recovery in late May)

- Overall reduction ranging from **39% to 56% of seats offered by airlines**
- Overall reduction of **872 to 1,303 million passengers**
- Approx. **USD 153 to 231 billion potential loss** of gross operating revenues of airlines

U-shaped path (Scenario 2: restart in third quarter or later)

- Overall reduction ranging from **49% to 72% of seats offered by airlines**
- Overall reduction of **1,124 to 1,540 million passengers**
- Approx. **USD 198 to 273 billion potential loss** of gross operating revenues of airlines

The impacts depend on duration and magnitude of the outbreak and containment measures, the degree of consumer confidence for air travel, and economic conditions, etc.

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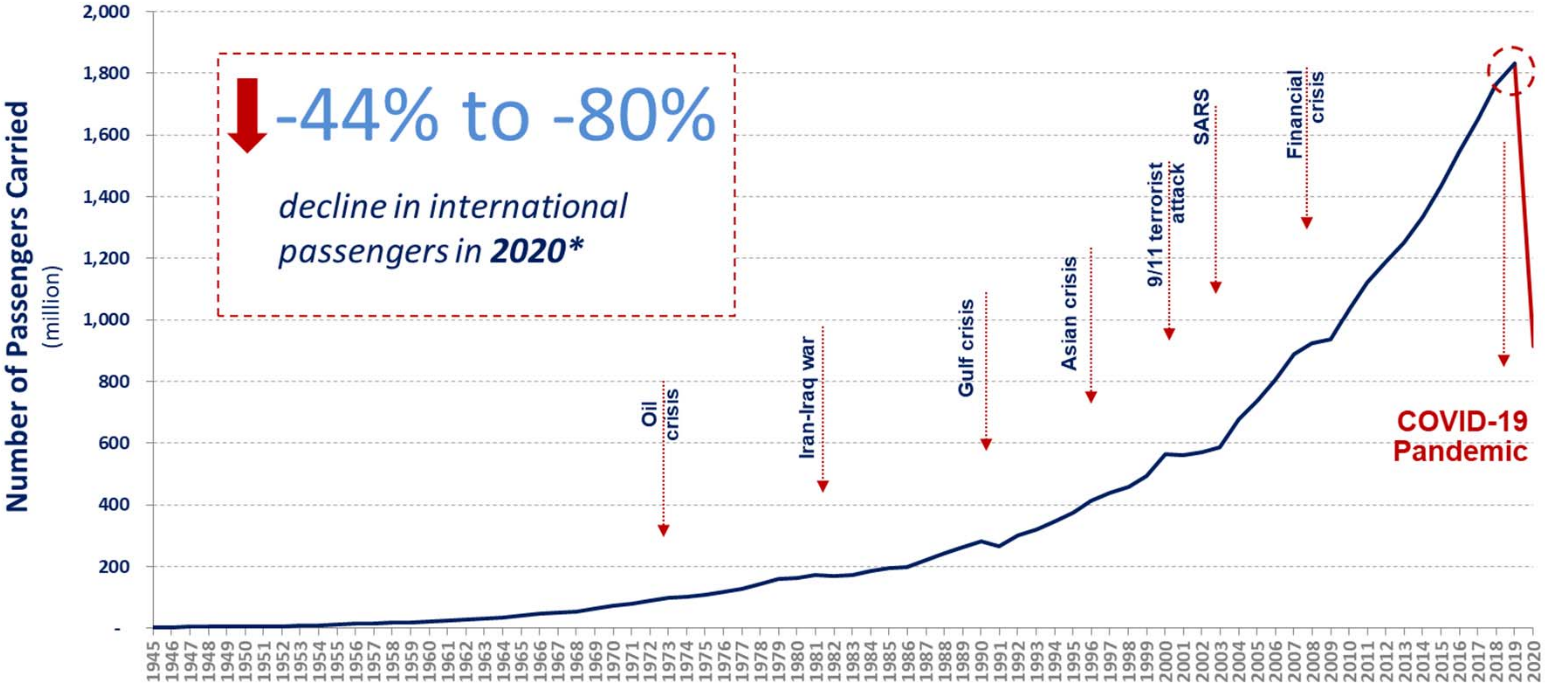
International passenger traffic collapses with unprecedented decline in history

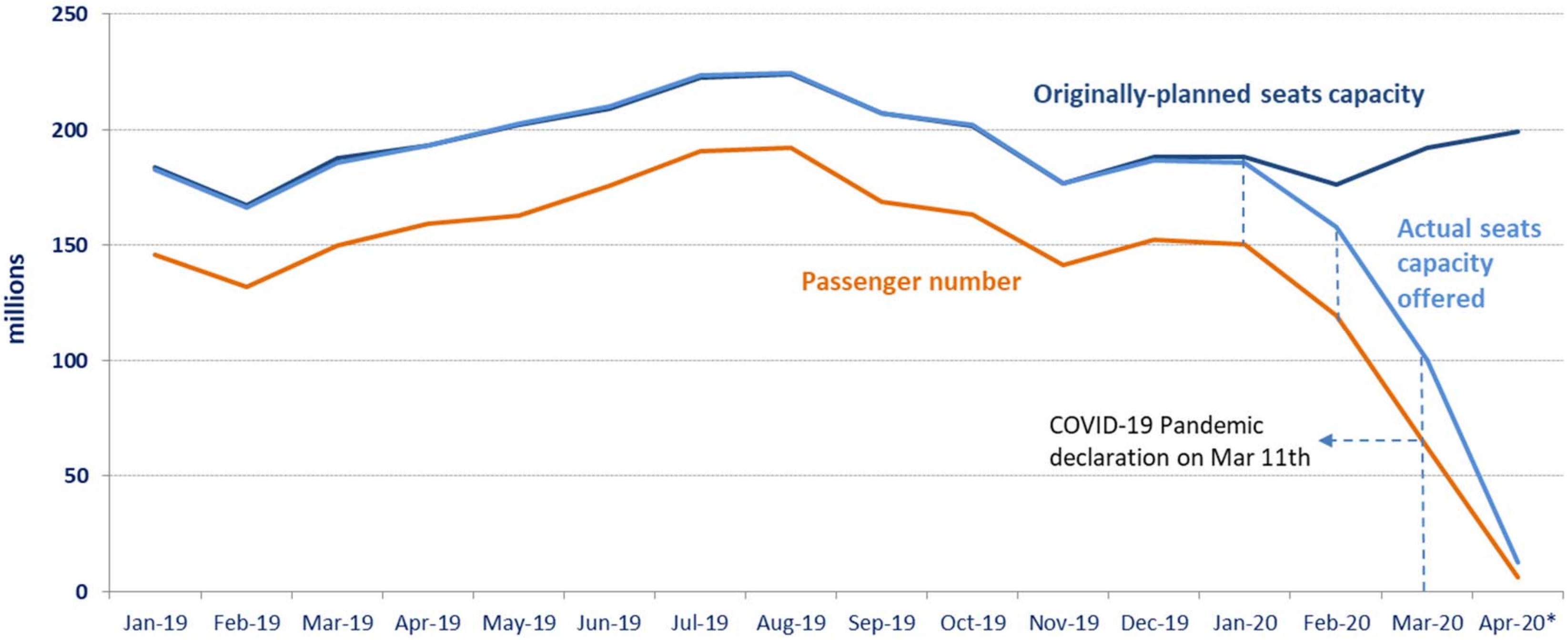
World international passenger traffic evolution 1945 – 2020*



Source: ICAO Air Transport Reporting Form A and A-S plus ICAO estimates

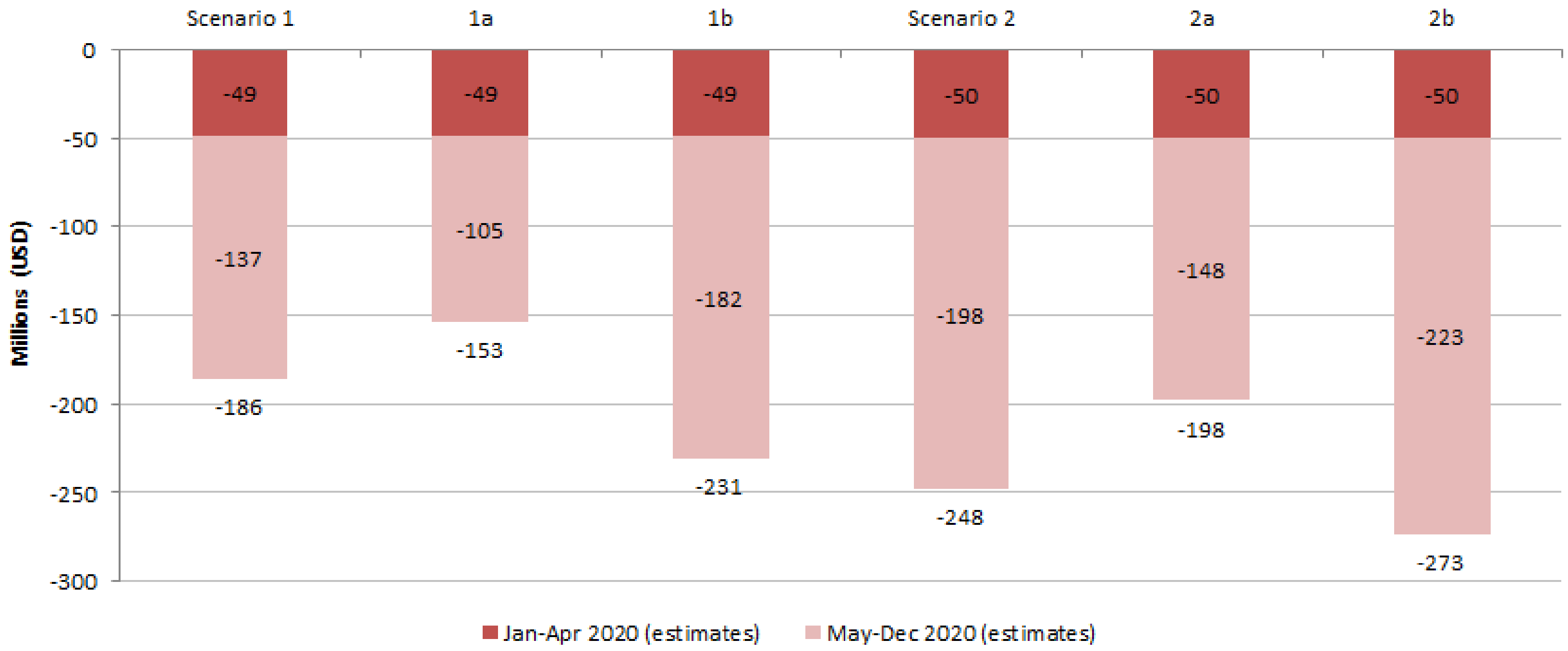
Drastic capacity cut along with dramatic drop in demand

Comparison of international passenger numbers and capacity



Source: ICAO ADS-B and OAG plus estimates

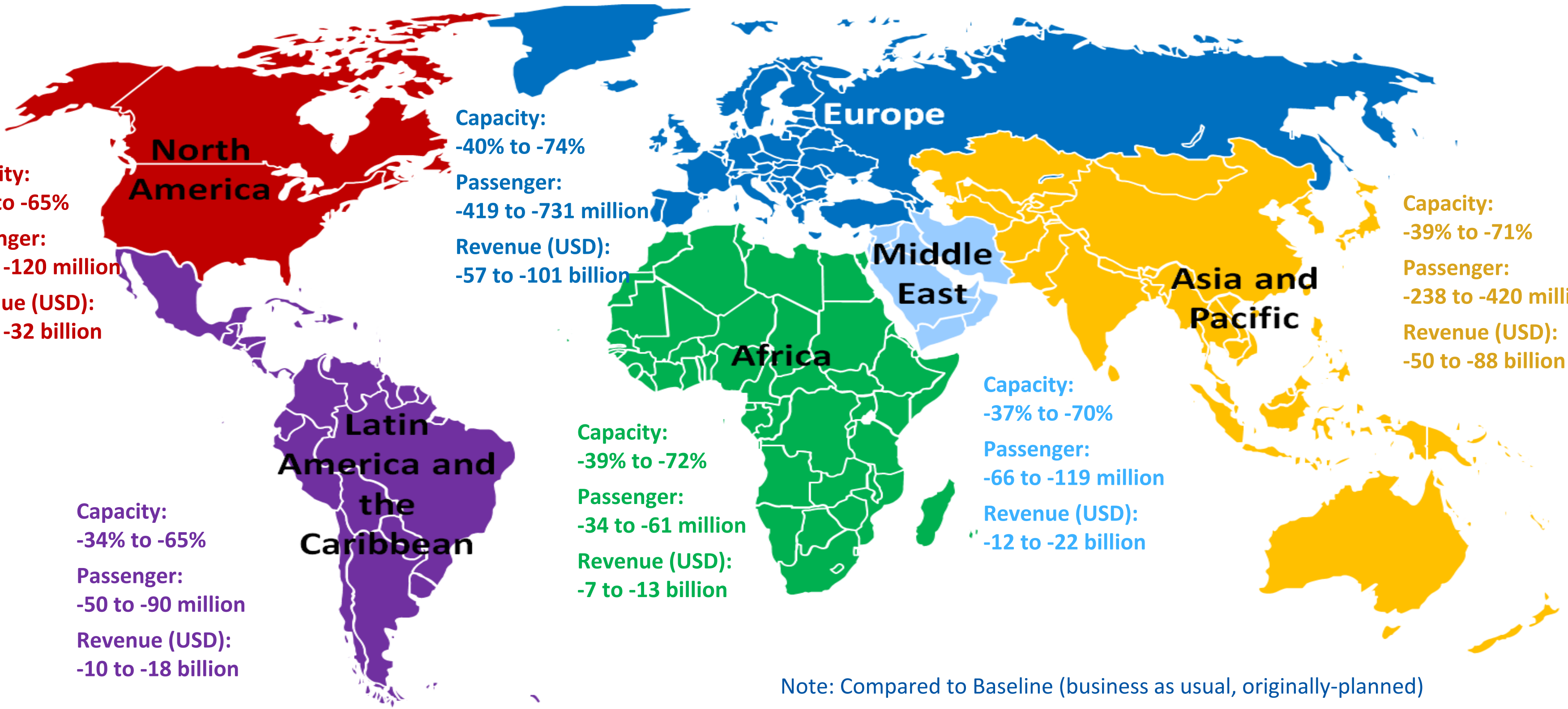
Approximately USD 50 billion international passenger revenue loss from Jan to Apr 2020



Note: Compared to Baseline (business as usual, originally-planned)

Source: ICAO estimates

Estimated impact on international passenger traffic and revenues by region for 2020



Note: Compared to Baseline (business as usual, originally-planned)

Source: ICAO estimates

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Estimated impact on airport passenger traffic and revenues by region for 2020 (by ACI)

Note: Compared to Baseline (business as usual, originally-planned); airport passenger traffic includes both international and domestic; revenues include both aeronautical and non-aeronautical.

Source: ACI Policy Brief - COVID-19 Relief Measures to Ensure the Survival of the Airport Industry (2020/01)

Global impact of COVID-19 on aviation, tourism, trade and economy

- **International air passenger traffic:** An overall reduction of international passengers ranging from 44% to 80% in 2020 compared to 2019 (by **ICAO**)
- **Airports**: An estimated loss of two-fifths of passenger traffic and 45% or over USD76 billion airport revenues in 2020 compared to business as usual (by **ACI**)
- **Airlines**: A 48% decline of revenue passenger kilometres (RPKs, both international and domestic) in 2020 compared to 2019 (by **IATA**)
- **Tourism**: A decline in international tourism receipts of between USD 300 to 450 billion in 2020, almost one third of the USD 1.5 trillion generated in 2019, with 96% of worldwide destinations having travel restrictions (by **UNWTO**)
- **Trade**: A fall of global merchandise trade volume by between 13 and 32% in 2020 compared to 2019 (by **WTO**)
- **Global economy**: A projected -3% contraction in world GDP in 2020, far worse than during the 2008–09 financial crisis (by **IMF**)

Scenario Building

As overall severity and duration of the pandemic are still uncertain, six different recovery paths under two indicative scenarios are developed to explore the potential "short-term" economic implication of the COVID-19 pandemic.

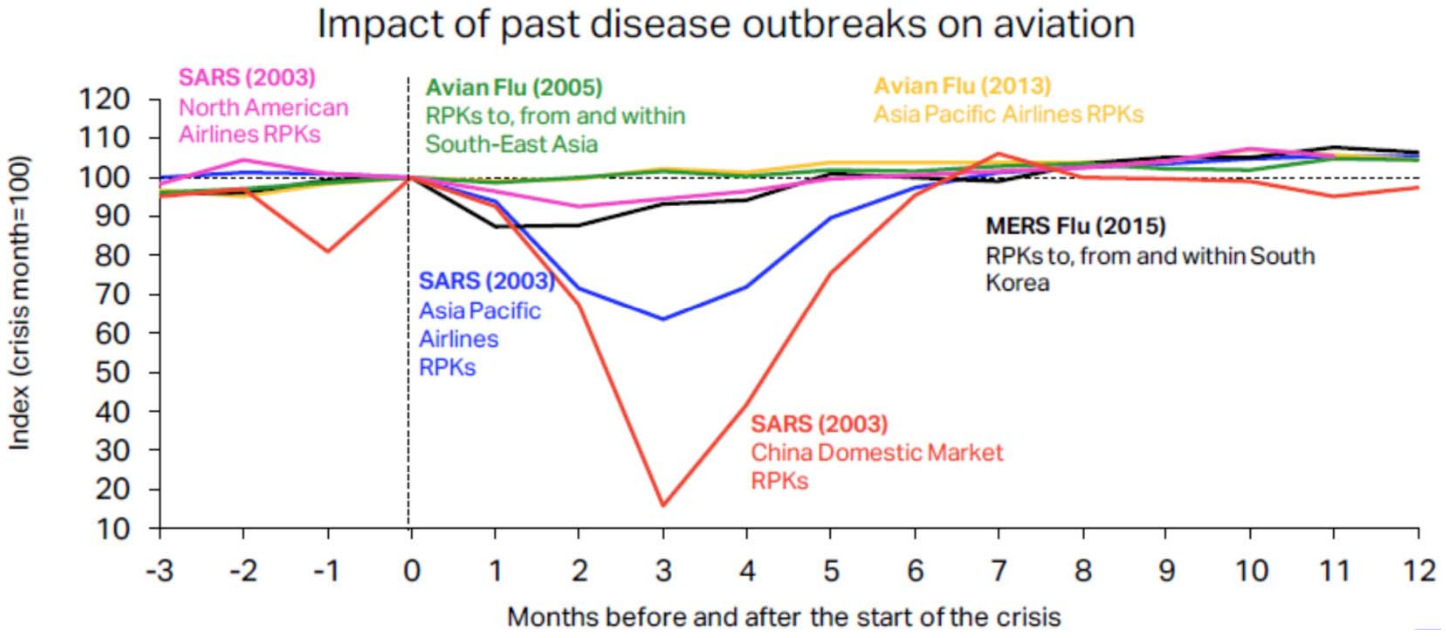
Illustrative scenarios: Baseline, V-shaped and U-shaped

- 3 scenarios to assess the possible economic impact of COVID-19:
  - **Baseline**: counterfactual scenario, in which the COVID-19 pandemic does not occur, that is, **originally-planned** or **business as usual**
  - **Scenario 1**: **V-shaped** path, normal shape for recession, a brief period of contraction followed by quick/smooth recovery
  - **Scenario 2**: **U-shaped** path, prolonged contraction and muted recovery, possibility of not to return to trend line growth (L-shaped)
- Analytical focus, for the time being, on:
  - Near-term, i.e. monthly profile from **January to December 2020**
  - Scheduled **international passenger** traffic

What does Scenario mean?

- Scenarios 1 and 2 are **not forecasts** of what is most likely to happen. Given a rapidly changing environment, these scenarios are merely indicative of **possible paths or consequential outcomes out of many**.
- The exact path (depth, length and shape) will depend upon various factors, inter alia, duration and magnitude of the outbreak and containment measures, availability of government assistance, consumer confidence, and economic conditions.
- Scenarios 1 and 2 are differentiated in terms of **supply (output)** and **demand (spending)** conditions, mainly, a) the timing and scale of airline capacity decline and recovery, and b) the degree of consumer confidence in air travel that can be translated into demand or load factor.

Previous outbreaks/pandemics had a V-shaped impact on aviation



Source: IATA Economics using data from IATA Statistics

The impact of COVID-19 has already surpassed the 2003 SARS outbreak which had resulted in reduction of annual RPKs by 8% and USD 6 billion revenues for Asia/Pacific airlines. **The 6-month recovery path of SARS might not apply to today's situation.**

Source: IATA COVID-19 Updated Impact Assessment (24 March 2020)

Uncertainties surrounding the outlook

- How long will the pandemic last and what will be the severity levels?
- How deep and how long will the global recession be?
- How long will lockdowns and travel restrictions continue?
- How fast will consumer confidence in air travel be restored?
- How long can the air transport industry withstand the current finical adversity?

Due to extreme uncertainty, 6 different paths up till 4Q 2020 are considered

- **Baseline (counterfactual, no COVID-19 pandemic)**
  - **Originally-planned or business as usual**: trend line growth from 2019 level
- **Scenario 1 (V-shaped path, a first sign of recovery in late May)**
  - **Path 1**: Smooth capacity recovery to 80% of Baseline level by December but weak demand return
  - **Path 1a**: Strong capacity rebound to 90% in tandem with quick demand return
  - **Path 1b**: Slow progression to recover 60% capacity by December with downside risk in demand
- **Scenario 2 (U-shaped path, restart in 3/4Q or even later)**
  - **Path 2**: Slow progression of capacity recovery to 50% of Baseline with sluggish demand growth
  - **Path 2a**: Strong capacity rebound to 90% by December, outpacing demand recovery
  - **Path 2b**: Prolonged downturn towards 2021 with marginal seasonal adjustments

Assumptions: Baseline

<table>
<tr><th rowspan="2">Assumptions (Global)</th><th colspan="2">Baseline (Originally-planned, business as usual)</th></tr>
<tr><th>Seat capacity</th><th>Passenger load factor</th></tr>
<tr><td>January 2020</td><td rowspan="3">Airlines' winter schedules filed with OAG as of 6 January 2020</td><td rowspan="12">Forecasted 2020 load factor by region/route group, based on ICAO long-term traffic forecasts (LTF), which was adjusted monthly by difference between 2019 actual monthly results (ICAO, IATA) and 2019 LTF forecasted load factor</td></tr>
<tr><td>February 2020</td></tr>
<tr><td>March 2020</td></tr>
<tr><td>April 2020</td><td rowspan="6">Maximum number of seats taken from airlines' summer schedules filed with OAG during the period from 6 January 2020 to 20 April 2020</td></tr>
<tr><td>May 2020</td></tr>
<tr><td>June 2020</td></tr>
<tr><td>July 2020</td></tr>
<tr><td>August 2020</td></tr>
<tr><td>September 2020</td></tr>
<tr><td>October 2020</td><td rowspan="3">Using 2019 winter schedule as the base, and applying the growth rate of 2019/2018</td></tr>
<tr><td>November 2020</td></tr>
<tr><td>December 2020</td></tr>
</table>

Note 1: A list of route group is shown in **Appendix D**.

Note 2: Average air fares (i.e. passenger yield multiplied by average trip distance) for each region/route group are used to estimate gross passenger operating revenues.

Assumptions: Scenario 1

Assumptions (Global)	Scenario 1 (V-shaped)	
	Seat capacity	Passenger load factor
January 2020	Actual capacity based on ICAO ADS-B data	January 2020 results by region/route group
February 2020		February 2020 results by region/route group
March 2020		20 to 25 percentage points lower than Baseline
April 2020	Twice of actual capacity based on ICAO ADS-B data from 1 to 15 April	30 percentage points lower than Baseline with adjustment of GDP impact by region/route group
May 2020	Most recent airlines' schedules filed with OAG or world average of -89% from Baseline whichever is smaller	25 (1), 20 (1a) and 30 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
June 2020	Most recent airlines' schedules filed with OAG or world average of -77% (1), -69% (1a) and -82% (1b) from Baseline whichever is smaller	20 (1), 10 (1a) and 25 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
July 2020	Most recent airlines' schedules filed with OAG or world average of -59% (1), -44% (1a) and -72% (1b) from Baseline whichever is smaller	15 (1), 5 (1a) and 20 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
August 2020	Most recent airlines' schedules filed with OAG or world average of -44% (1), -29% (1a) and -62% (1b) from Baseline whichever is smaller	10 (1), 5 (1a) and 20 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
September 2020	Most recent airlines' schedules filed with OAG or world average of -34% (1), -24% (1a) and -55% (1b) from Baseline whichever is smaller	10 (1), 5 (1a) and 25 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
October 2020	Most recent airlines' schedules filed with OAG or world average of -29% (1), -18% (1a) and -50% (1b) from Baseline whichever is smaller	
November 2020	Most recent airlines' schedules filed with OAG or world average of -24% (1), -13% (1a) and -45% (1b) from Baseline whichever is smaller	
December 2020	Most recent airlines' schedules filed with OAG or world average of -19% (1), -9% (1a) and -40% (1b) from Baseline whichever is smaller	10 (1), 5 (1a) and 20 (1b) percentage points lower than Baseline with adjustment of GDP impact by region/route group

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Assumptions: Scenario 2

Assumptions (Global)	Scenario 2 (U-shaped)	
	Seat capacity	Passenger load factor
January 2020	Actual capacity based on ICAO ADS-B data	January 2020 results by region/route group
February 2020		February 2020 results by region/route group
March 2020		25 percentage points lower than Baseline
April 2020	Twice of actual capacity based on ICAO ADS-B data from 1 to 15 April	30 percentage points lower than Baseline with adjustment of GDP impact by region/route group
May 2020	Most recent airlines' schedules filed with OAG or world average of -94% from Baseline whichever is smaller	30 (2 & 2b) and 25 (2a) percentage points lower than Baseline with adjustment of GDP impact by region/route group
June 2020		25 (2 & 2a) and 30 (2b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
July 2020	Most recent airlines' schedules filed with OAG or world average of -86% (2), -79% (2a) and -89% (2b) from Baseline whichever is smaller	25 (2 & 2b) and 20 (2b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
August 2020	Most recent airlines' schedules filed with OAG or world average of -74% (2), -54% (2a) and -84% (2b) from Baseline whichever is smaller	20 (2), 15 (2a) and 25 (2b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
September 2020	Most recent airlines' schedules filed with OAG or world average of -67% (2), -34% (2a) and -84% (2b) from Baseline whichever is smaller	
October 2020	Most recent airlines' schedules filed with OAG or world average of -62% (2), -24% (2a) and -79% (2b) from Baseline whichever is smaller	15 (2), 10 (2a) and 25 (2b) percentage points lower than Baseline with adjustment of GDP impact by region/route group
November 2020	Most recent airlines' schedules filed with OAG or world average of -57% (2), -16% (2a) and -79% (2b) from Baseline whichever is smaller	
December 2020	Most recent airlines' schedules filed with OAG or world average of -52% (2), -10% (2a) and -79% (2b) from Baseline whichever is smaller	15 (2), 10 (2a) and 20 (2b) percentage points lower than Baseline with adjustment of GDP impact by region/route group

Data used for scenario analysis

- **Seat capacity (Baseline):** OAG airlines schedule data; Route Online; and airline websites
- **Seat capacity (actual):** ICAO ADS-B operational data
- **Load factor:** ICAO long-term traffic forecasts (LTF); ICAO statistical reporting forms; IATA economics data; and airline news release
- **Historical passenger traffic**: ICO Annual Report of the Council, and ICAO statistical reporting forms
- **Yield:** ICAO revenue-cost study of airlines (RCA); and ICAO-ICM MIDT passenger origin-destination data
- **Macroeconomic factors:** Income elasticity of demand estimated for ICAO LTF; and IMF economic outlook data

Scenario Analysis

Figures and estimates herein is <u>subject to substantial changes</u>, and will be updated with the situation evolving and more information available.

Impact on International Passenger Seat Capacity (Supply)

- Prior to the outbreak, airlines had planned to increase seat capacity by 3.4% for 2020, compared to 2019.
- According to the latest estimates, passenger seat capacity could instead drop from the above Baseline by 39 to 56% (Scenario 1) and 49 to 72% (Scenario 2).
- This capacity level would be 37% to 54% (Scenario 1) and 47% to 71% (Scenario 2) below the 2019 level.
- Biggest capacity reduction (%) is expected to be in Europe, followed by Africa and Asia/Pacific.

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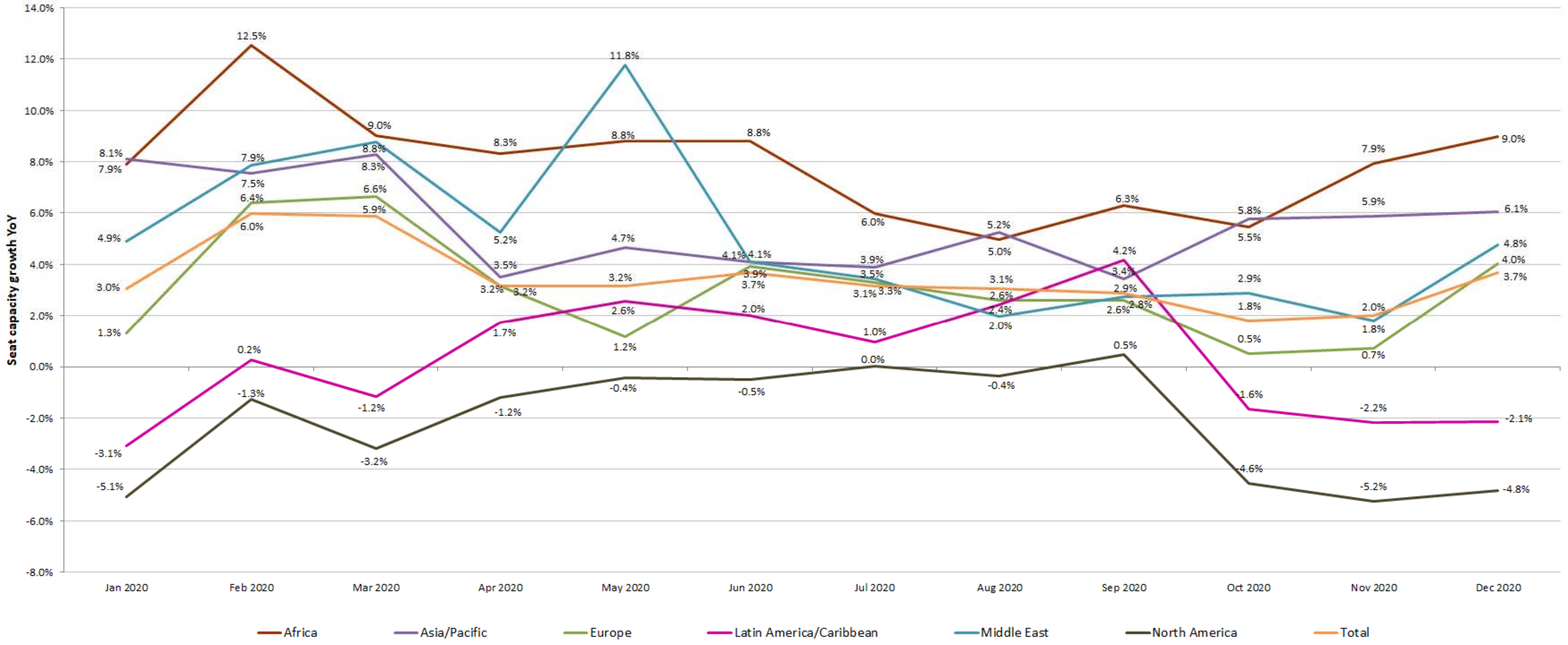
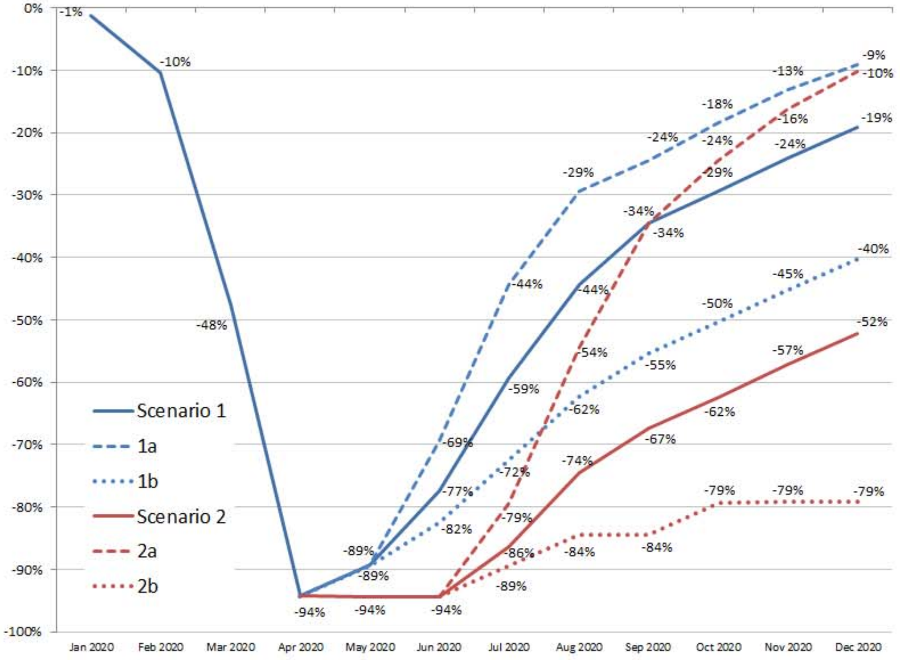
Baseline: 3.4% seat capacity increase from 2019

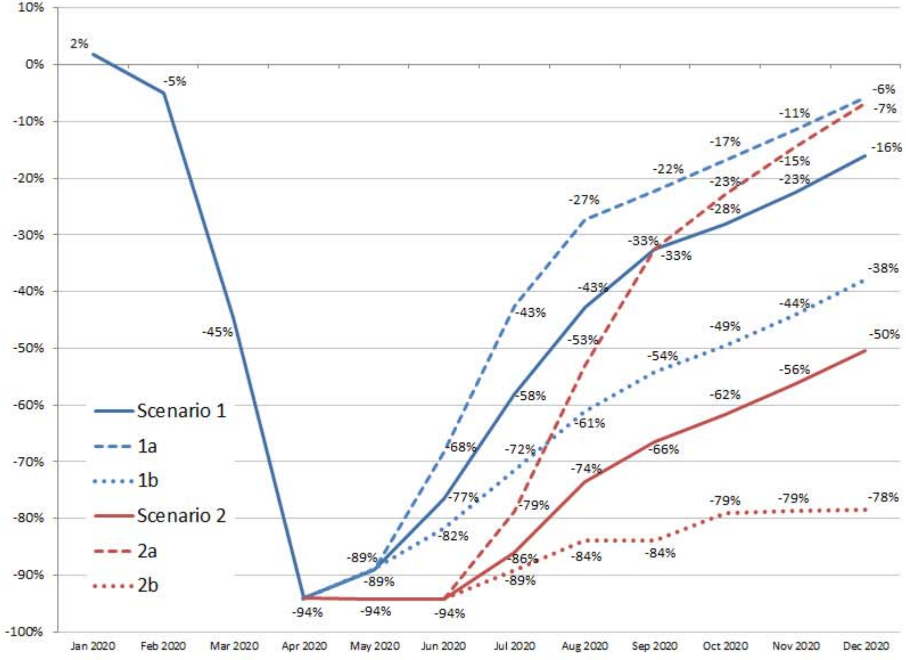


Scenarios 1 & 2: seat capacity reduction by 39 - 72% from Baseline and 37 - 71% from 2019

Comparison to Baseline



Comparison to 2019 (YoY)



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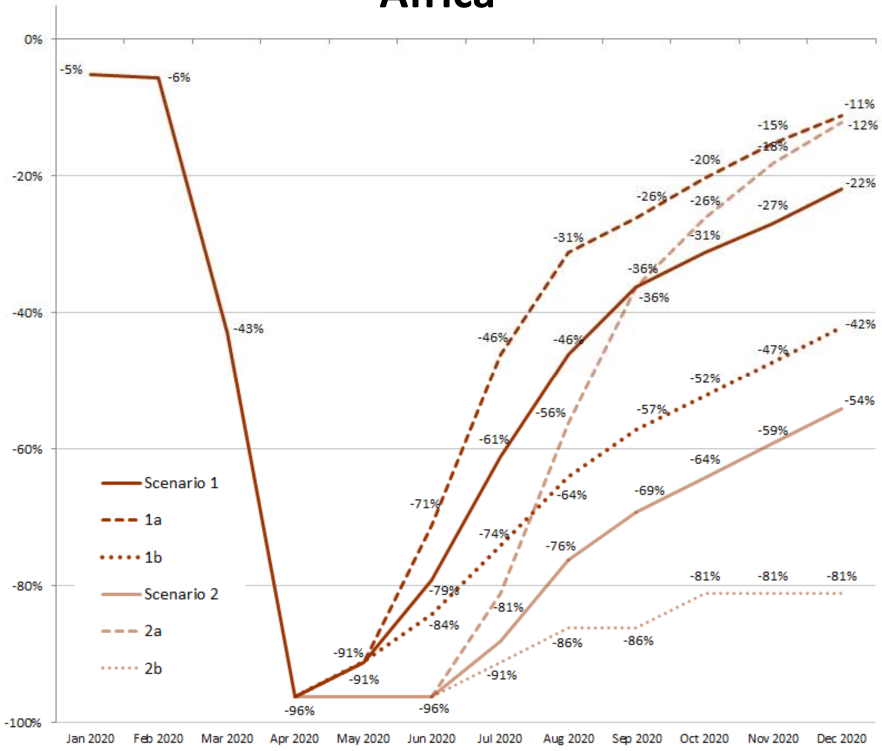
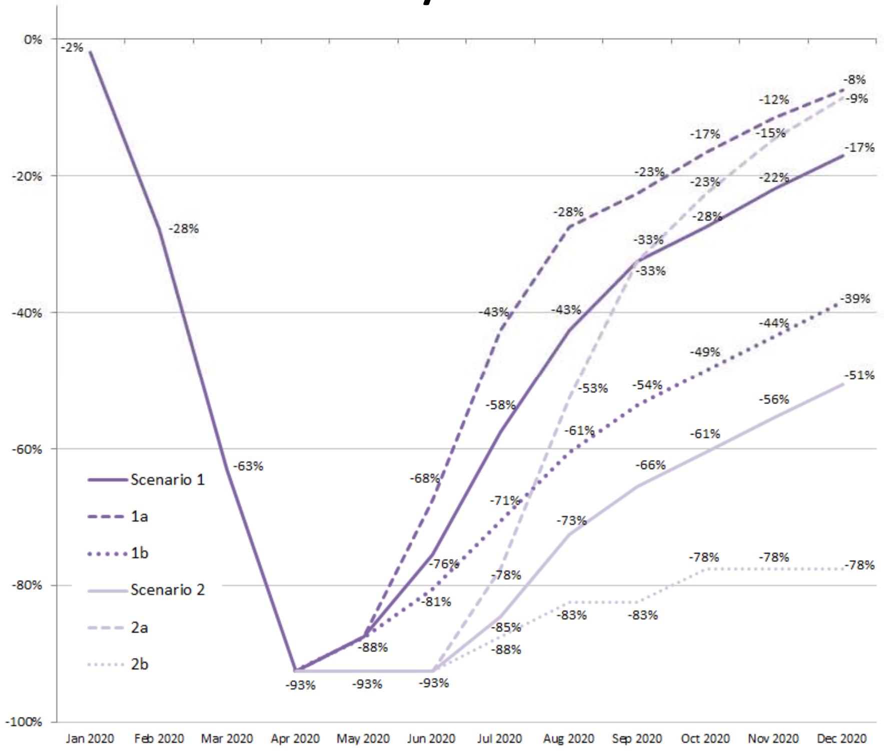
Break-down of seat capacity reduction from Baseline by region (1)

Africa

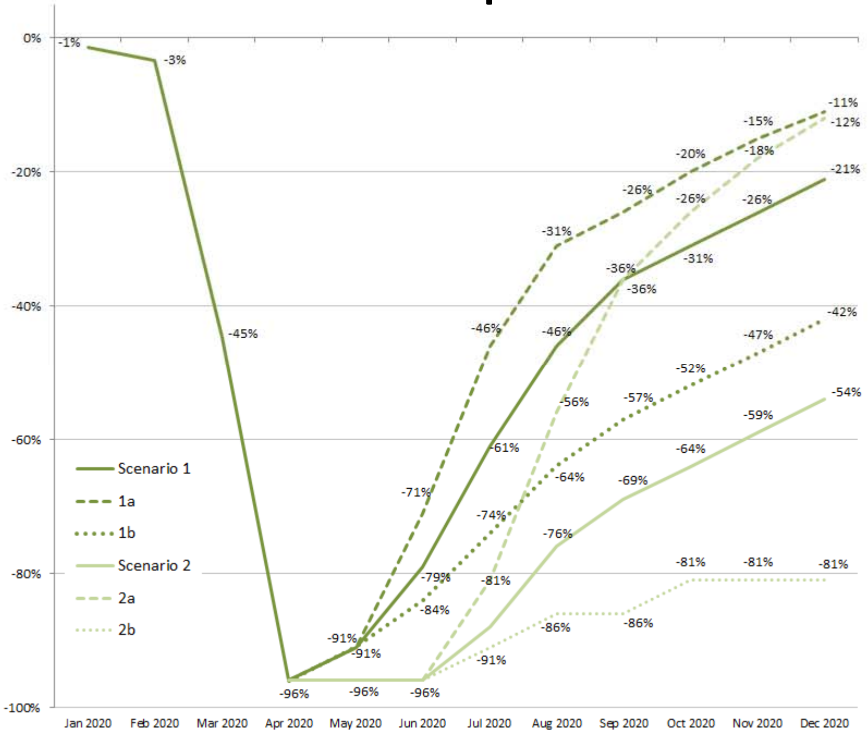


Asia/Pacific

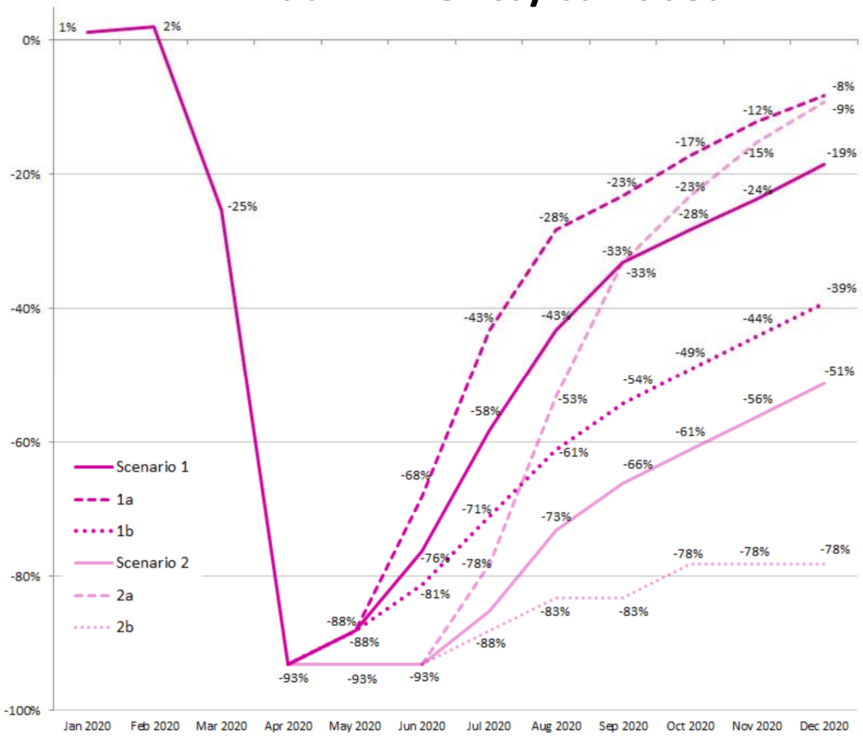


Break-down of seat capacity reduction from Baseline by region (2)

Europe



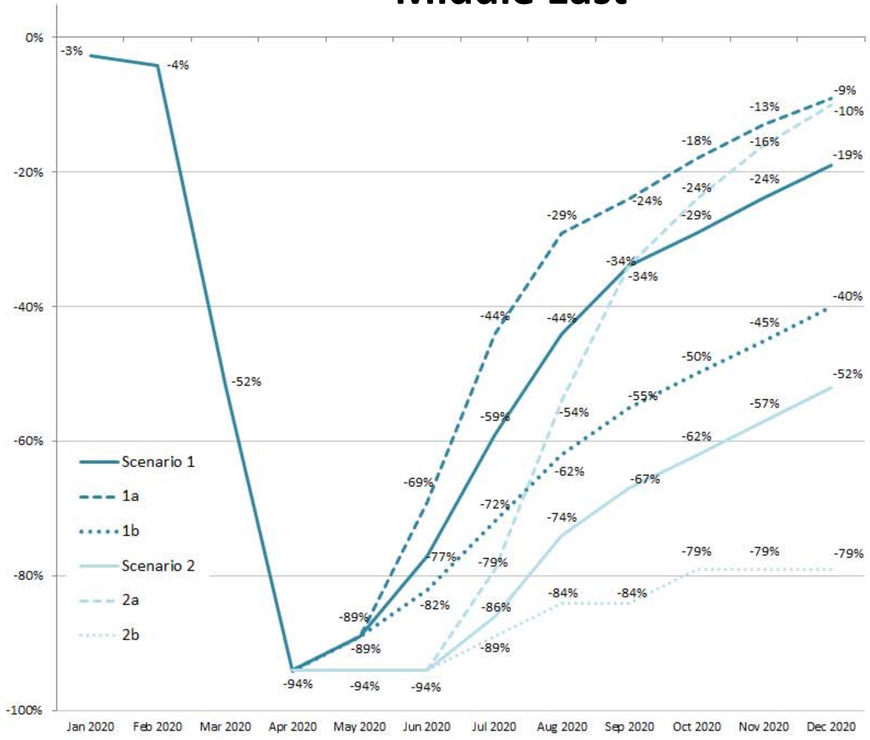
Latin America/Caribbean



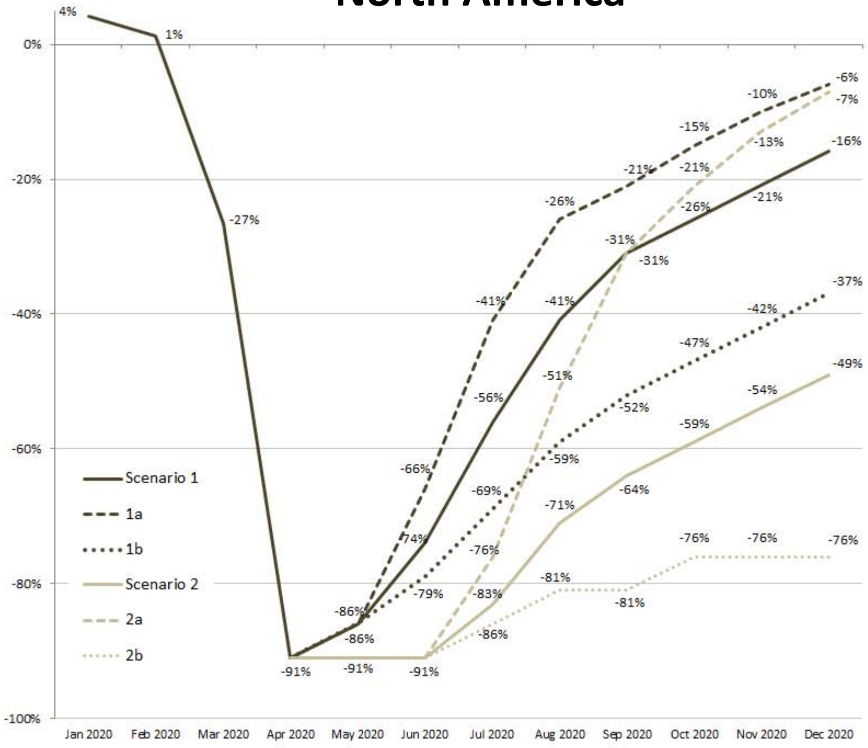
Source: ICAO estimates based on OAG, Routes Online and airline websites

Break-down of seat capacity reduction from Baseline by region (3)

Middle East



North America



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

Impact on International Passenger Numbers (Demand)

- Given the originally-planned seat capacity, passenger demand could have increased 67 million for 2020, compared to 2019.
- According to the latest estimates, passenger demand could instead drop from the above Baseline by 872 to 1,303 million (Scenario 1) and 1,124 to 1,540 million (Scenario 2).
- This demand level would be 805 to 1,236 million (Scenario 1) and 1,057 to 1,473 million (Scenario 2) below the 2019 level.
- The most substantial demand reduction is expected to be in Europe, hitting summer travel peak season, followed by Asia/Pacific.

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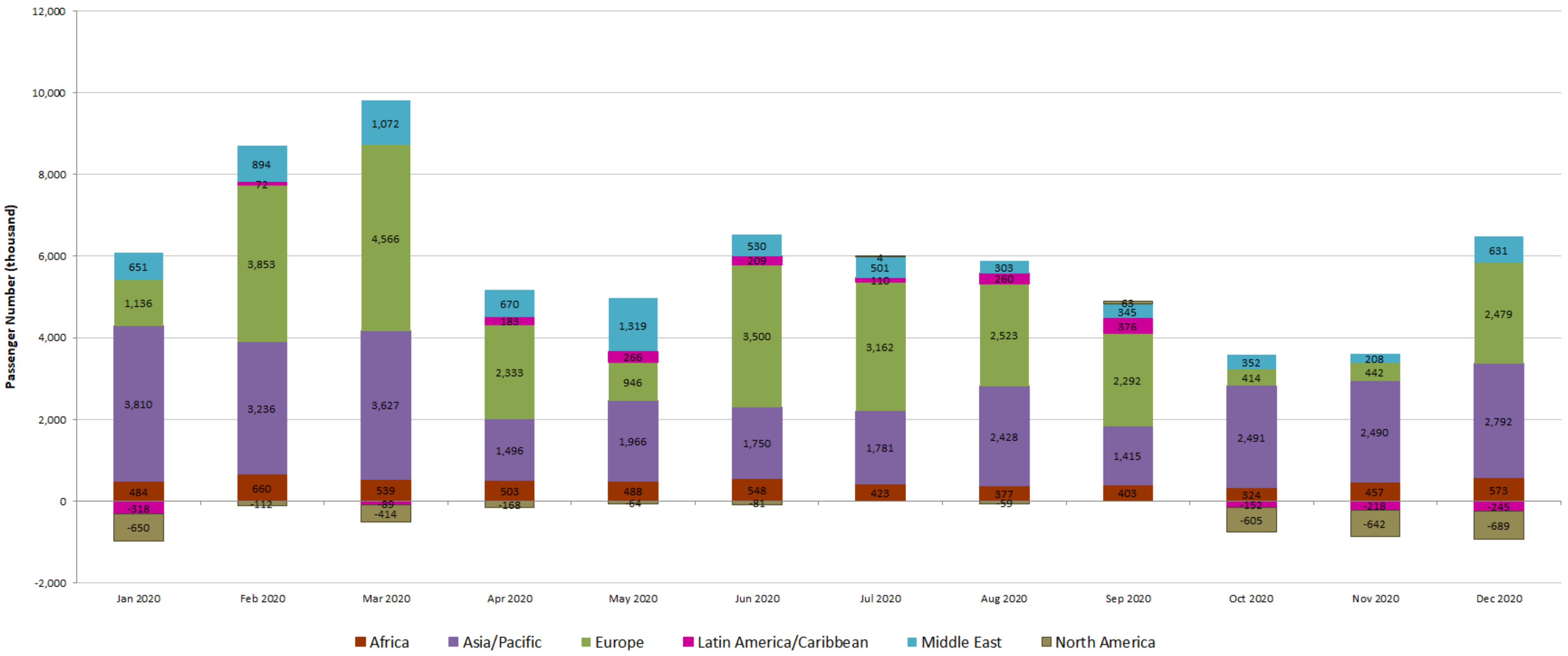
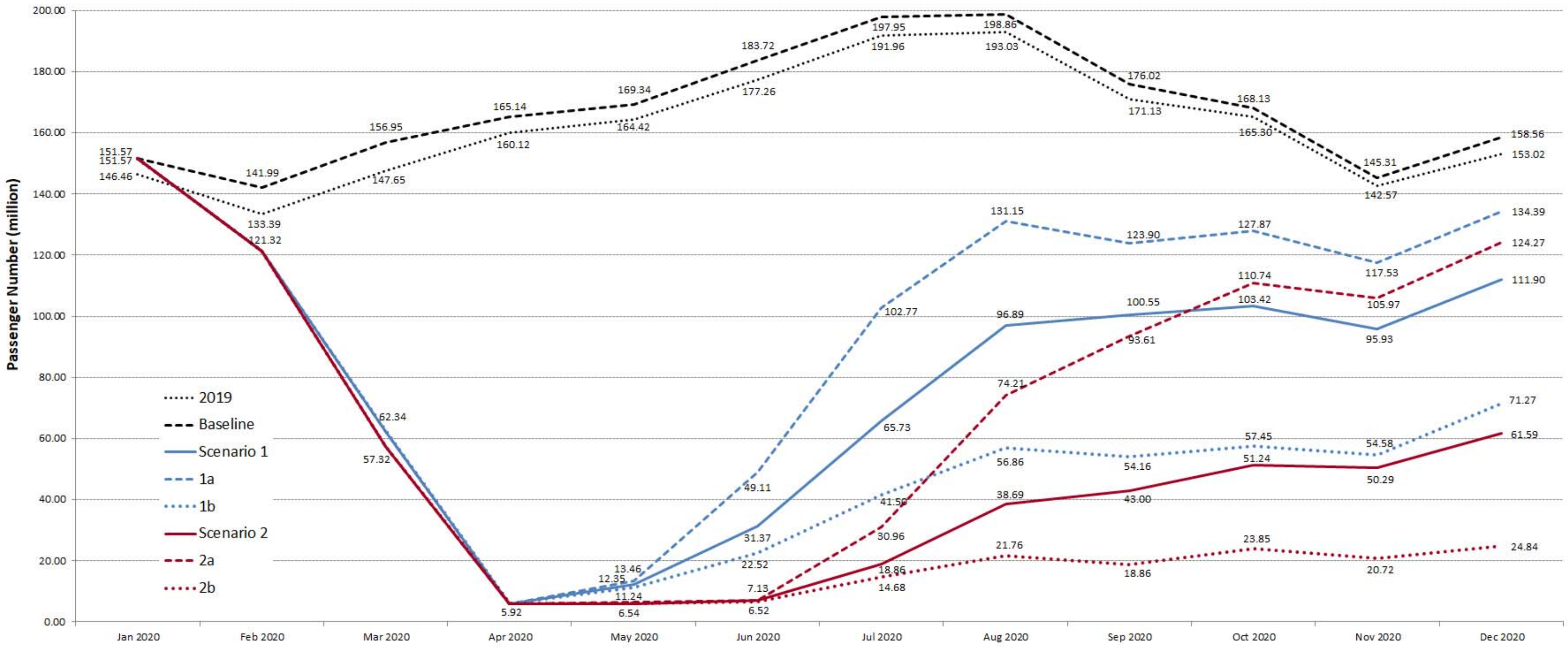
Baseline: 67 million increase of passengers from 2019



Note: Number of international passengers departing from each country and territory, which are aggregated at the regional level to avoid double counting

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

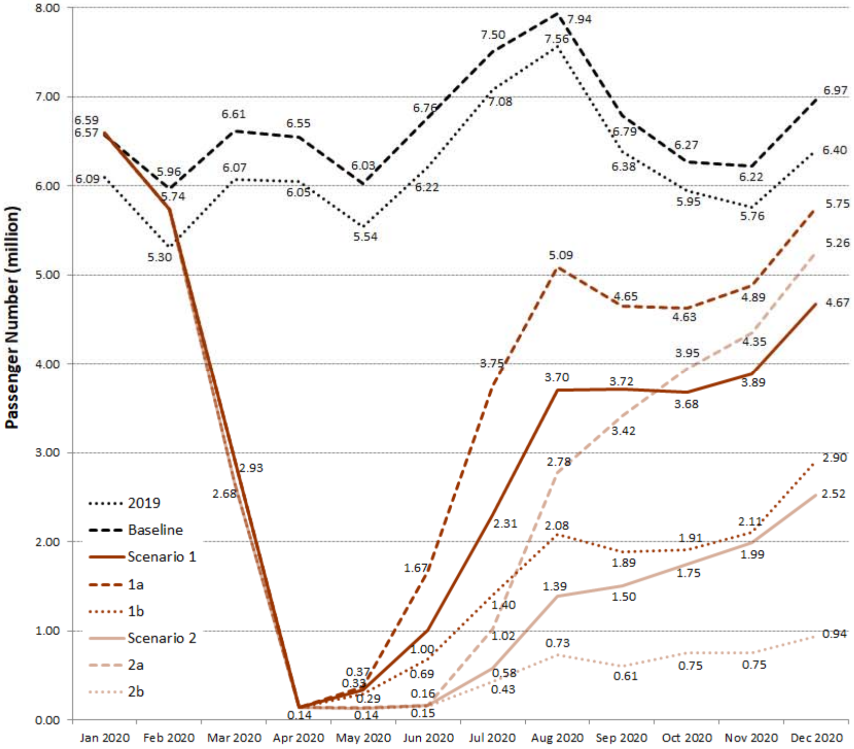
Scenarios 1 & 2: 872 - 1,540 million and 805 - 1,473 million less passengers than Baseline and 2019



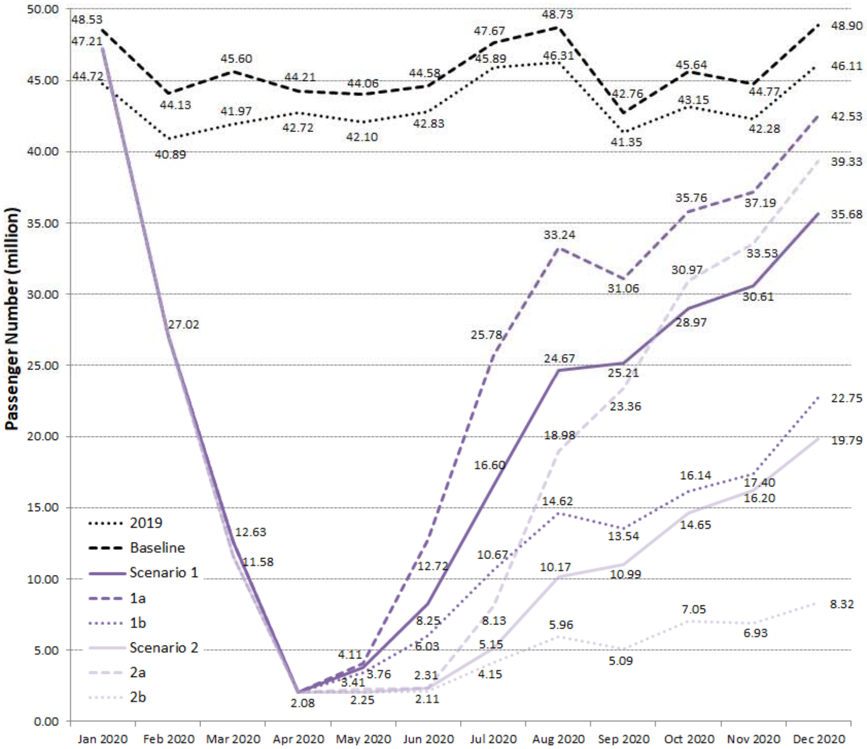
Note: Number of international passengers departing from each country and territory, which are aggregated at the regional level to avoid double counting

Break-down of passenger number by region (1)

Africa



Asia/Pacific



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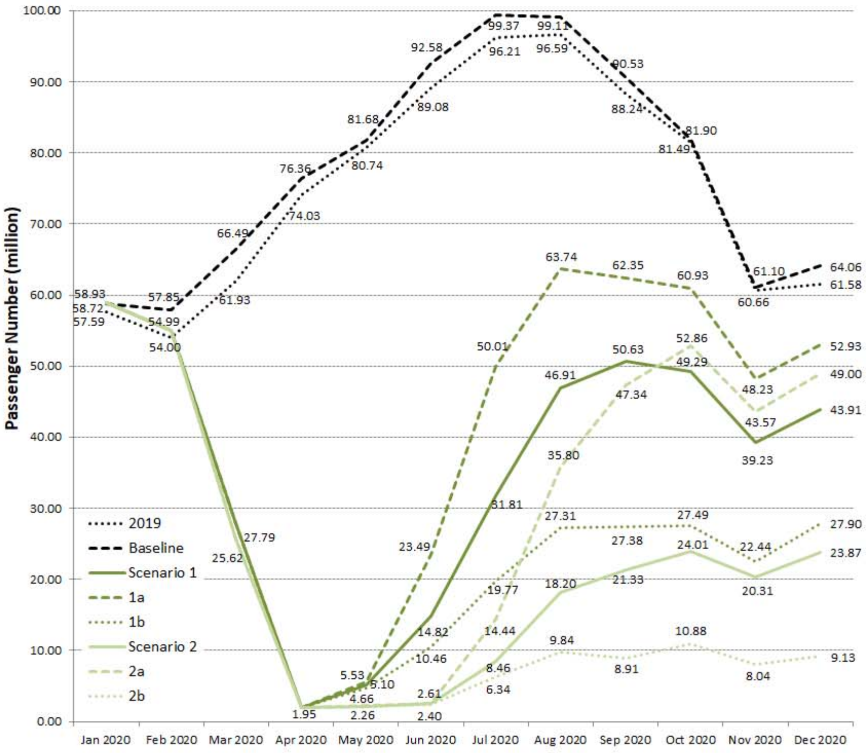
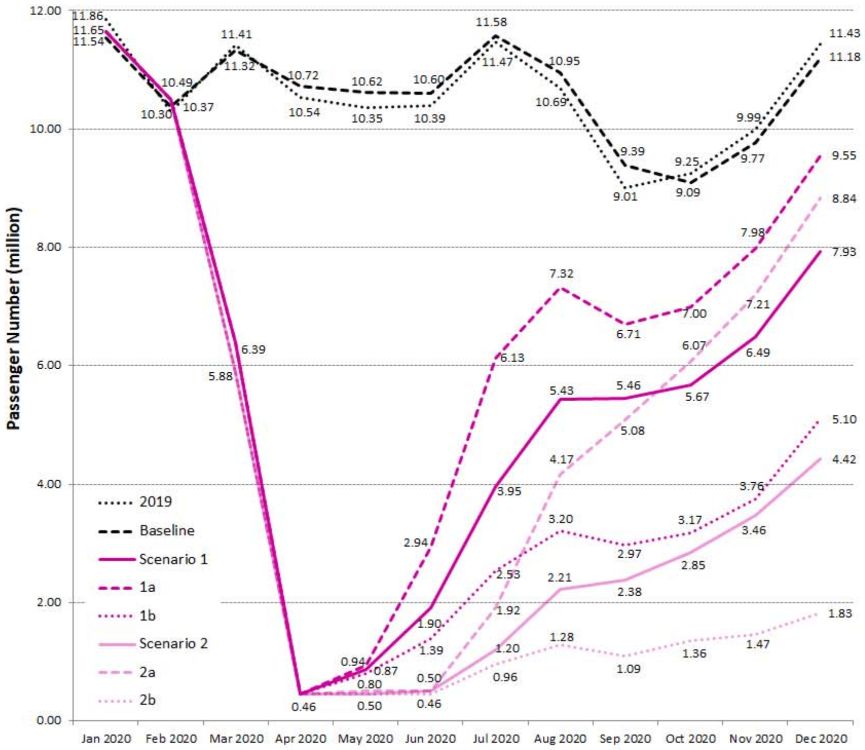
Break-down of passenger number by region (2)

Europe



Latin America/Caribbean



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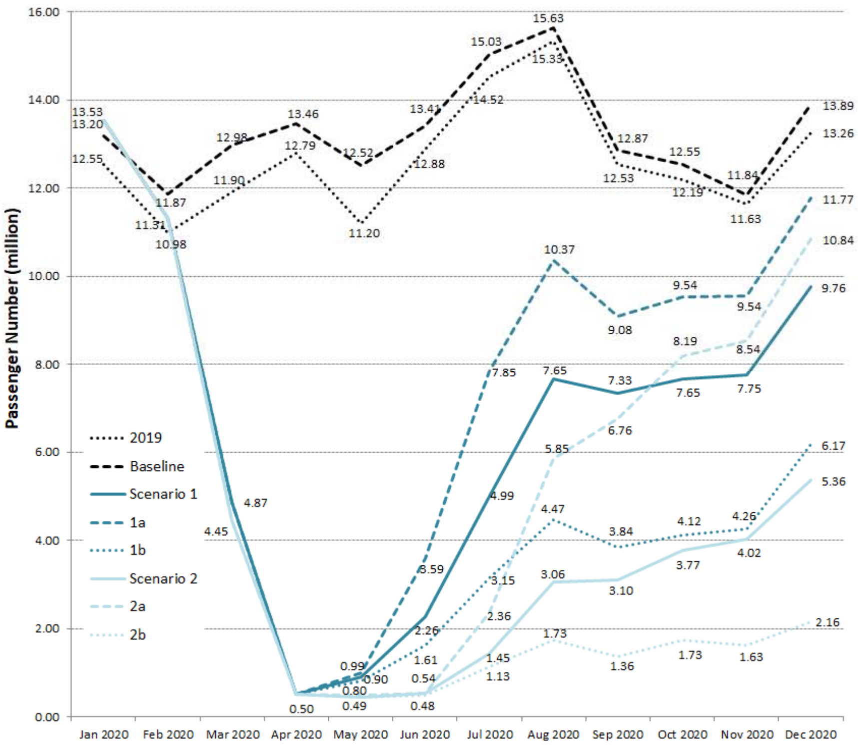
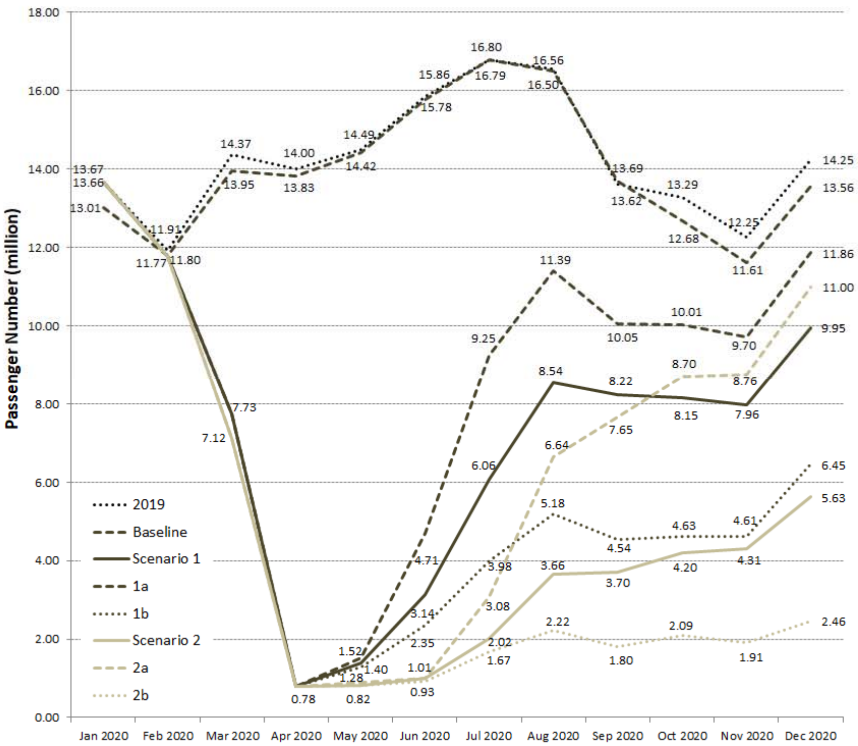
Break-down of passenger number by region (3)

Middle East



North America

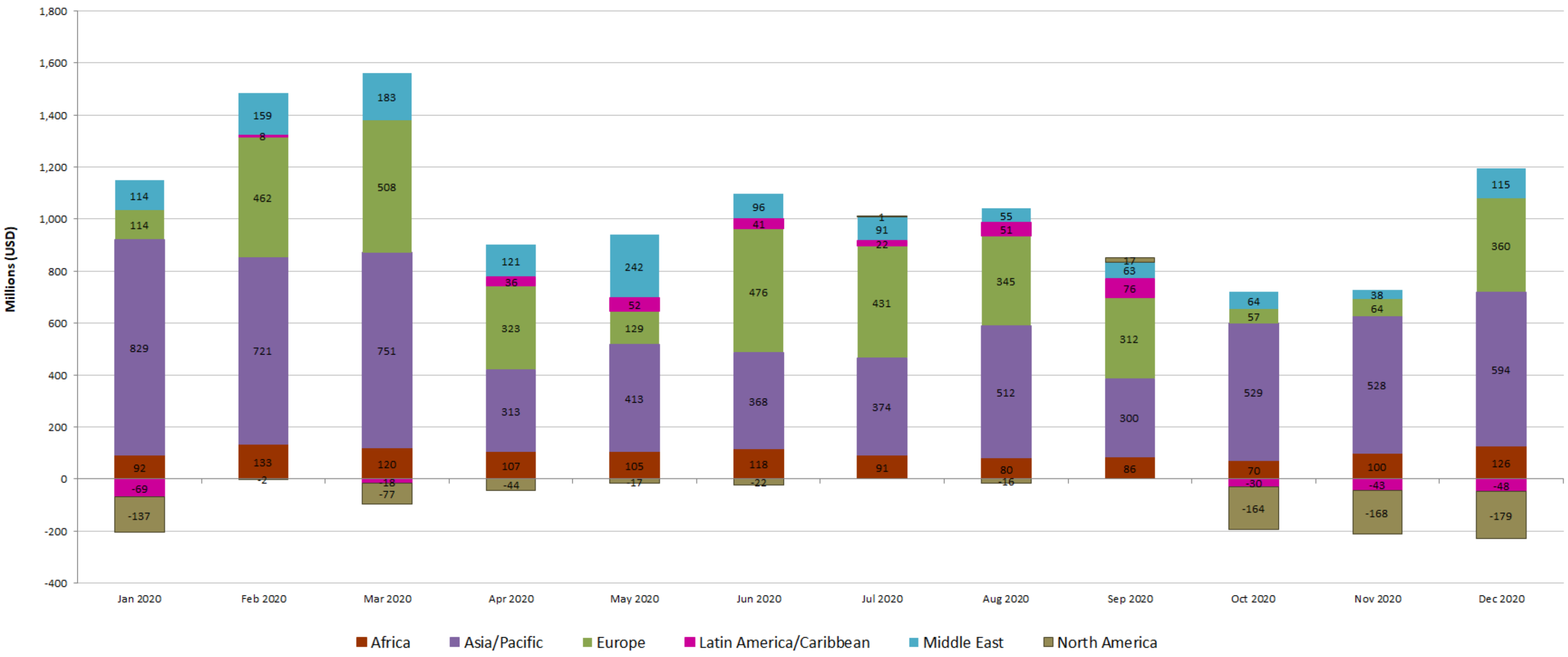


Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

Impact on Gross Passenger Operating Revenues of Airlines

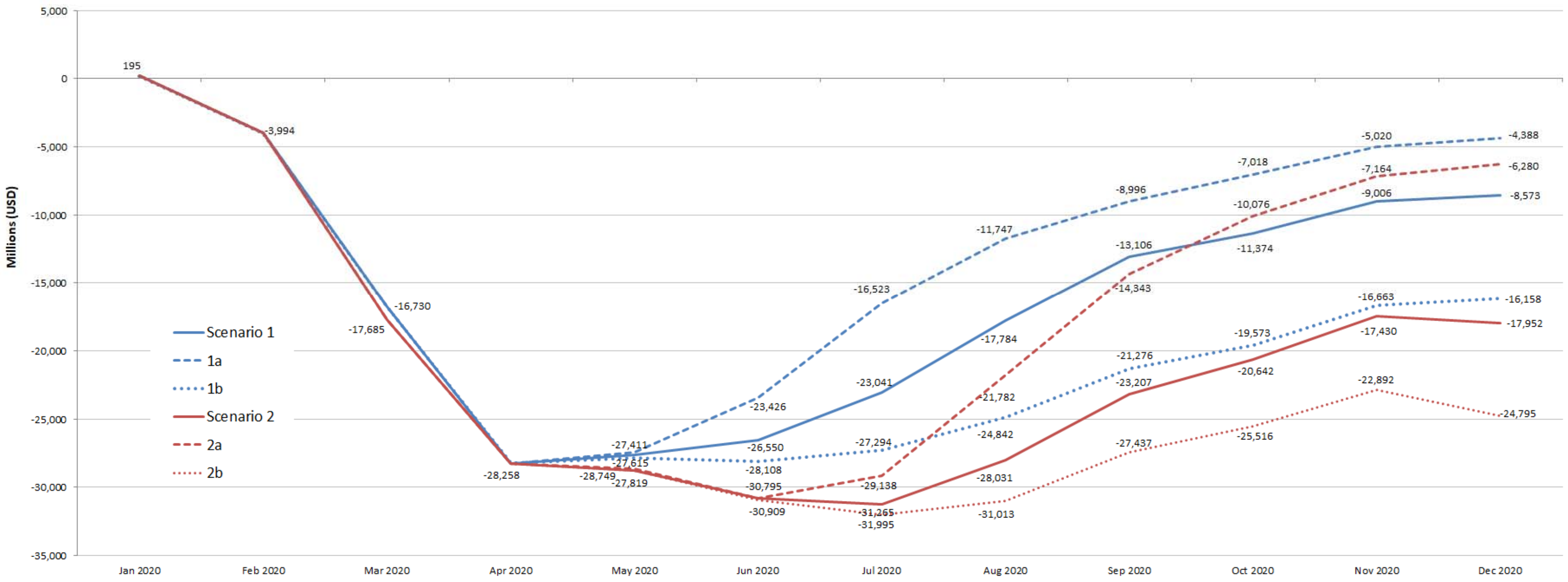
- With the originally-planned seat capacity and trend line growth of demand, airlines' gross passenger operating revenues could have increased USD 12 billion for 2020, compared to 2019.
- According to the latest estimates, airlines' revenues could instead plummet USD 153 to 231 billion (Scenario 1) and USD 198 to 273 billion (Scenario 2) below the above Baseline, or USD 142 to 219 billion (Scenario 1) and 186 to 261 billion (Scenario 2) below the 2019 level.
- Over two-third of revenue loss would be recorded by Europe and Asia/Pacific.

Baseline: USD 12 billion increase of revenues from 2019



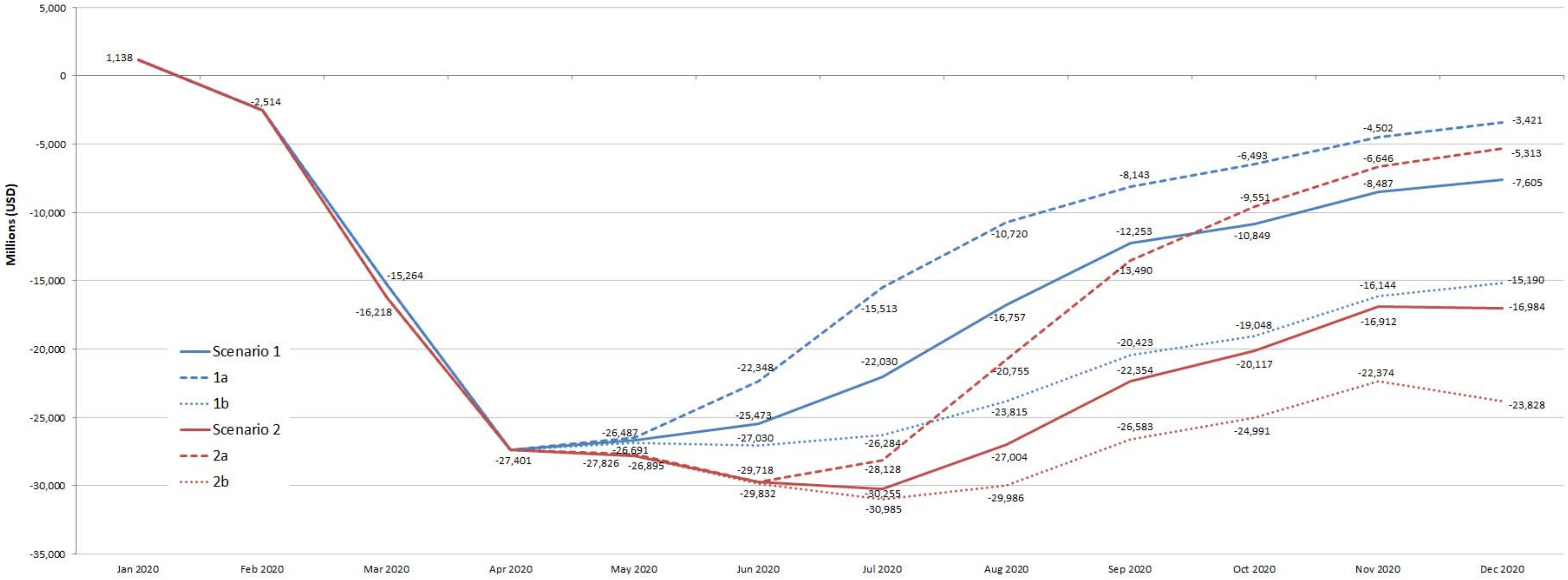
Note: The above revenues are gross passenger operating revenues of all airlines serving international routes from each country and territory, which are aggregated at the regional level (revenues of international routes to each country and territory were removed to avoid double counting.

Scenarios 1 & 2: USD 153 to 273 billion less revenues than Baseline



Note: The above revenues are gross passenger operating revenues of all airlines serving international routes from each country and territory, which are aggregated at the regional level (revenues of international routes to each country and territory were removed to avoid double counting.

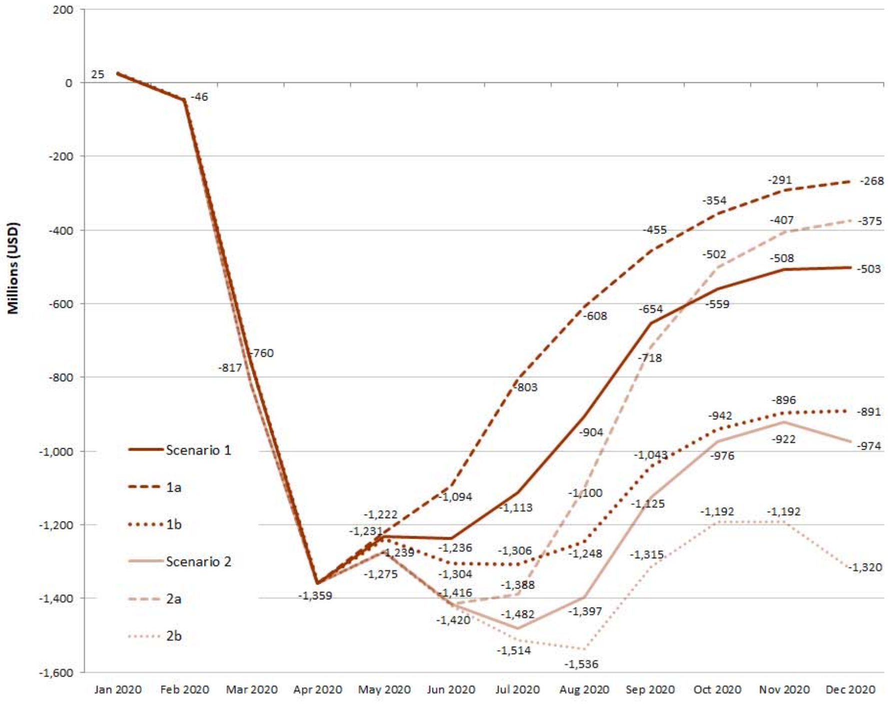
Scenarios 1 & 2: USD 142 to 261 billion less revenues than 2019



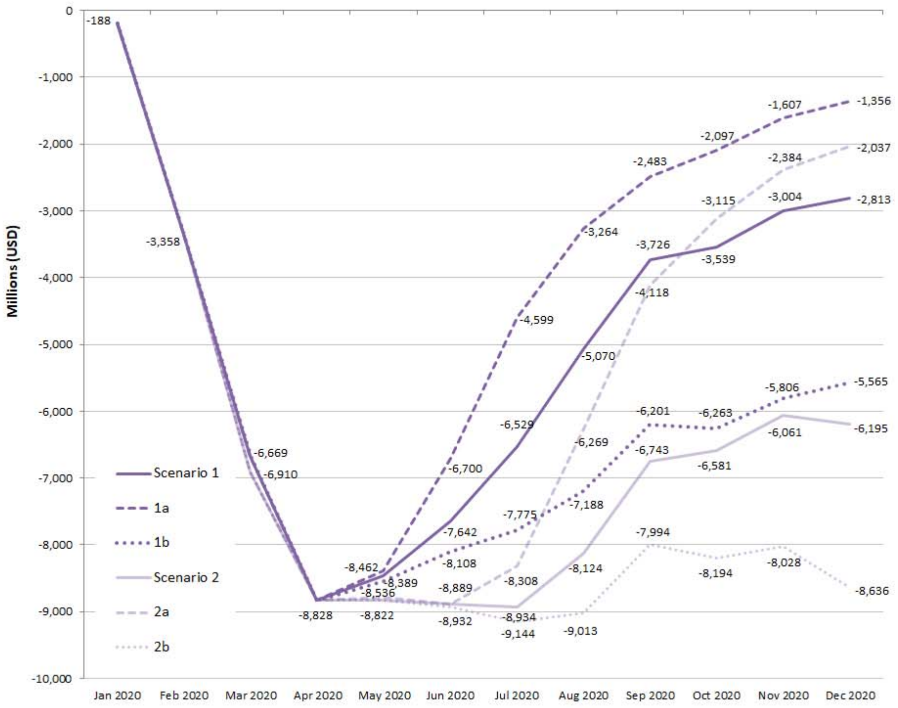
Note: The above revenues are gross passenger operating revenues of all airlines serving international routes <u>from</u> each country and territory, which are aggregated at the regional level (revenues of international routes <u>to</u> each country and territory were removed to avoid double counting.

Break-down of revenue reduction compared to Baseline by region (1)

Africa

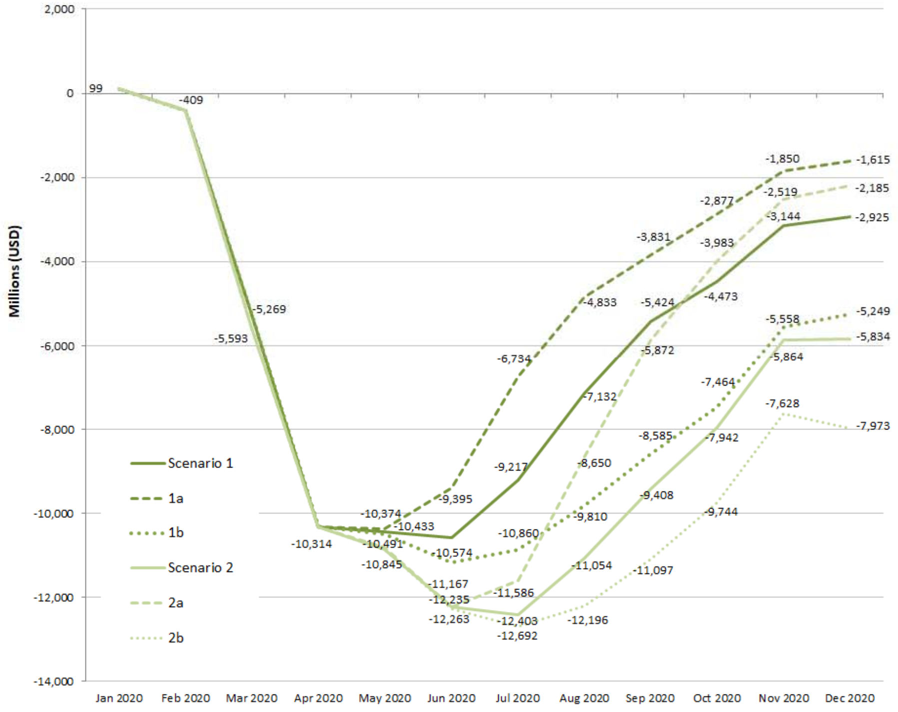


Asia/Pacific

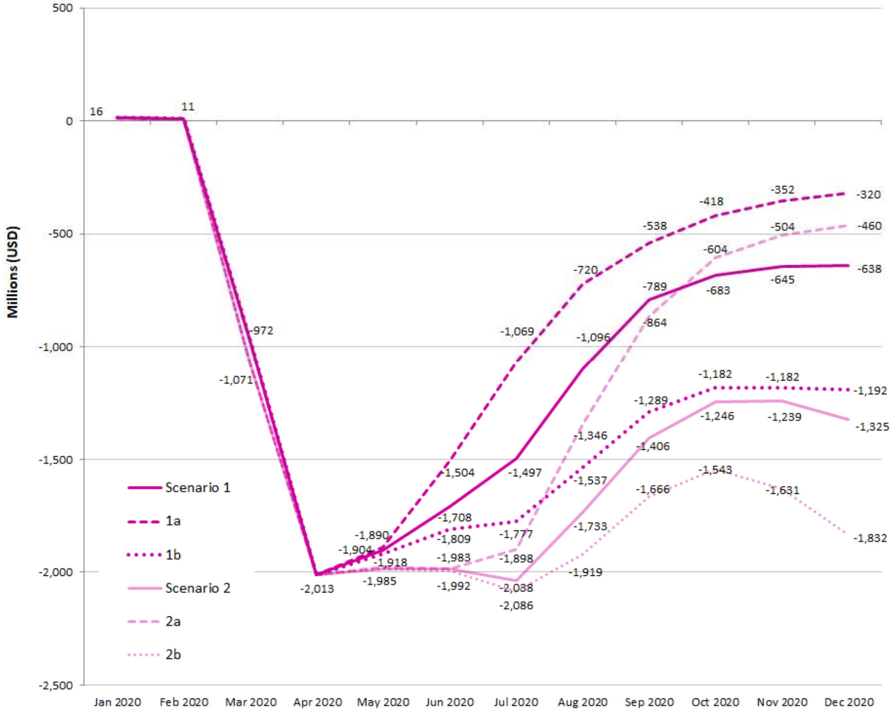


Break-down of revenue reduction compared to Baseline by region (2)

Europe

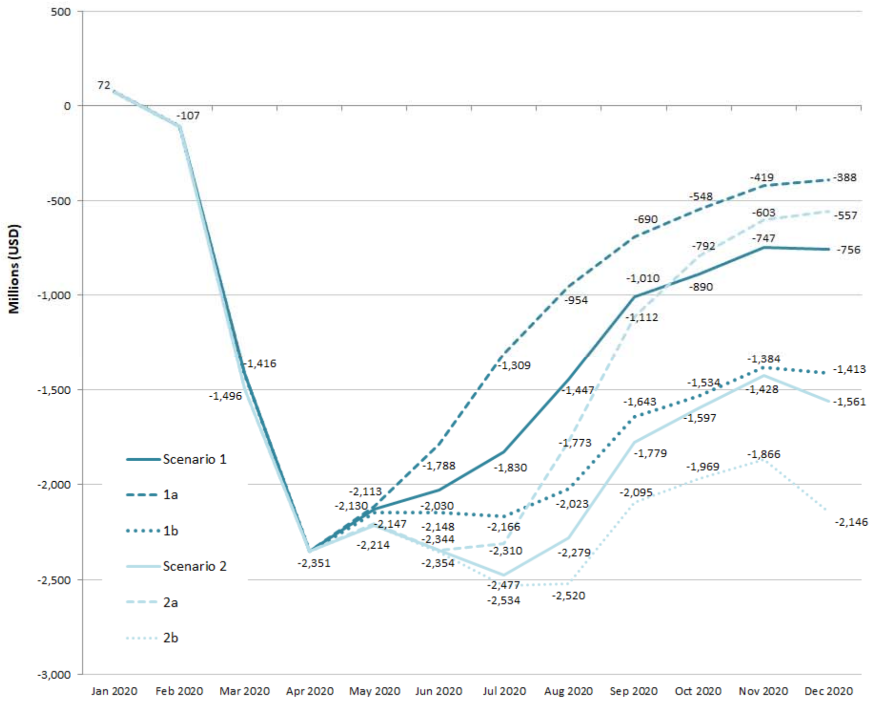


Latin America/Caribbean

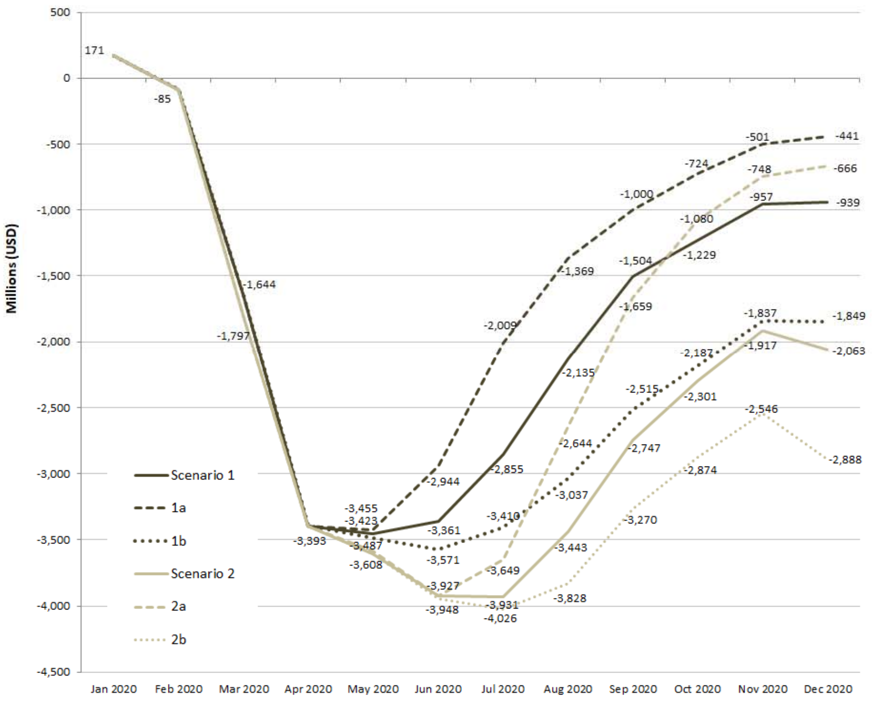


Break-down of revenue reduction compared to Baseline by region (3)

Middle East



North America



Summary of Key Impact Indicators

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Baseline compared to 2019 (year-on-year)

Compared to 2019 (year-on-year)	Baseline (Originally-planned or business as usual)		
Month	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
January 2020	3.0%	5.11	0.94
February 2020	6.0%	8.60	1.48
March 2020	5.9%	9.30	1.47
April 2020	3.2%	5.02	0.86
May 2020	3.2%	4.92	0.92
June 2020	3.7%	6.46	1.08
July 2020	3.1%	5.98	1.01
August 2020	3.1%	5.83	1.03
September 2020	2.9%	4.89	0.85
October 2020	1.8%	2.82	0.53
November 2020	2.0%	2.74	0.52
December 2020	3.7%	5.54	0.97
Total	**3.4%**	**67.22**	**11.65**

Compared to 2019 (year-on-year)	Baseline (Originally-planned or business as usual)		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	7.8%	5.78	1.23
Asia/Pacific	5.5%	29.28	6.23
Europe	2.9%	27.64	3.58
Latin America/Caribbean	0.2%	0.45	0.08
Middle East	4.9%	7.48	1.34
North America	-2.1%	-3.42	-0.81
Total	**3.4%**	**67.22**	**11.65**

Source: ICAO estimates

Estimated results by month: Scenario 1 compared to Baseline

Compared to Baseline (Originally-planned, business as usual)	Scenario 1 (V-shaped) Path 1			Scenario 1 (V-shaped) Path 1a			Scenario 1 (V-shaped) Path 1b		
Month	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
January 2020	-1.2%	0.00	0.19	-1.2%	0.00	0.19	-1.2%	0.00	0.19
February 2020	-10.3%	-20.67	-3.99	-10.3%	-20.67	-3.99	-10.3%	-20.67	-3.99
March 2020	-47.7%	-94.61	-16.73	-47.7%	-94.61	-16.73	-47.7%	-94.61	-16.73
April 2020	-94.3%	-159.22	-28.26	-94.3%	-159.22	-28.26	-94.3%	-159.22	-28.26
May 2020	-89.3%	-156.99	-27.61	-89.3%	-155.88	-27.41	-89.3%	-158.10	-27.82
June 2020	-77.4%	-152.34	-26.55	-69.4%	-134.60	-23.43	-82.4%	-161.20	-28.11
July 2020	-59.4%	-132.21	-23.04	-44.4%	-95.17	-16.52	-72.4%	-156.44	-27.29
August 2020	-44.4%	-101.98	-17.78	-29.4%	-67.71	-11.75	-62.4%	-142.00	-24.84
September 2020	-34.4%	-75.47	-13.11	-24.4%	-52.12	-9.00	-55.4%	-121.86	-21.28
October 2020	-29.4%	-64.71	-11.37	-18.4%	-40.26	-7.02	-50.4%	-110.68	-19.57
November 2020	-24.1%	-49.38	-9.01	-13.2%	-27.78	-5.02	-45.2%	-90.73	-16.66
December 2020	-19.1%	-46.66	-8.57	-9.2%	-24.17	-4.39	-40.2%	-87.29	-16.16
Total	**-45.5%**	**-1,054.24**	**-185.84**	**-38.6%**	**-872.19**	**-153.32**	**-55.8%**	**-1,302.79**	**-230.52**

Source: ICAO estimates

Estimated results by month: Scenario 1 compared to 2019 (year-on-year)

Compared to 2019 (year-on-year)	Scenario 1 (V-shaped) Path 1			Scenario 1 (V-shaped) Path 1a			Scenario 1 (V-shaped) Path 1b		
Month	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
January 2020	1.8%	5.11	1.13	1.8%	5.11	1.13	1.8%	5.11	1.13
February 2020	-5.0%	-12.07	-2.51	-5.0%	-12.07	-2.51	-5.0%	-12.07	-2.51
March 2020	-44.6%	-85.31	-15.26	-44.6%	-85.31	-15.26	-44.6%	-85.31	-15.26
April 2020	-94.1%	-154.20	-27.40	-94.1%	-154.20	-27.40	-94.1%	-154.20	-27.40
May 2020	-89.0%	-152.07	-26.69	-89.0%	-150.96	-26.49	-89.0%	-153.18	-26.90
June 2020	-76.6%	-145.88	-25.47	-68.3%	-128.14	-22.35	-81.8%	-154.74	-27.03
July 2020	-58.1%	-126.23	-22.03	-42.7%	-89.19	-15.51	-71.5%	-150.46	-26.28
August 2020	-42.7%	-96.15	-16.75	-27.3%	-61.88	-10.72	-61.3%	-136.17	-23.81
September 2020	-32.5%	-70.58	-12.26	-22.2%	-47.23	-8.15	-54.1%	-116.97	-20.43
October 2020	-28.1%	-61.89	-10.84	-16.9%	-37.44	-6.49	-49.5%	-107.86	-19.04
November 2020	-22.6%	-46.64	-8.49	-11.4%	-25.04	-4.50	-44.1%	-87.99	-16.14
December 2020	-16.1%	-41.12	-7.60	-5.8%	-18.63	-3.42	-38.0%	-81.75	-15.19
Total	**-43.7%**	**-987.02**	**-174.19**	**-36.5%**	**-804.97**	**-141.67**	**-54.2%**	**-1,235.57**	**-218.87**

Source: ICAO estimates

Estimated results by region: Scenario 1 compared to Baseline

Compared to Baseline (Originally-planned, business as usual)	Scenario 1 (V-shaped) Path 1			Scenario 1 (V-shaped) Path 1a			Scenario 1 (V-shaped) Path 1b		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	-45.7%	-41.48	-8.85	-38.7%	-34.00	-7.24	-55.9%	-51.51	-11.01
Asia/Pacific	-45.2%	-286.90	-59.83	-38.6%	-238.24	-49.54	-55.4%	-356.09	-74.49
Europe	-47.7%	-504.40	-69.22	-40.4%	-418.90	-57.40	-58.1%	-618.68	-85.08
Latin America/Caribbean	-40.2%	-60.44	-11.92	-33.6%	-49.56	-9.77	-49.8%	-75.23	-14.84
Middle East	-44.2%	-80.74	-14.64	-37.4%	-66.30	-12.01	-54.4%	-100.61	-18.26
North America	-40.1%	-80.26	-21.39	-33.3%	-65.19	-17.36	-50.0%	-100.67	-26.84
Total	**-45.5%**	**-1,054.24**	**-185.84**	**-38.6%**	**-872.19**	**-153.32**	**-55.8%**	**-1,302.79**	**-230.52**

Source: ICAO estimates

Estimated results by region: Scenario 1 compared to 2019 (year-on-year)

Compared to 2019 (year-on-year)	Scenario 1 (V-shaped) Path 1			Scenario 1 (V-shaped) Path 1a			Scenario 1 (V-shaped) Path 1b		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	-41.5%	-35.70	-7.62	-33.9%	-28.22	-6.01	-52.4%	-45.73	-9.78
Asia/Pacific	-42.2%	-257.62	-53.60	-35.2%	-208.96	-43.31	-52.9%	-326.81	-68.26
Europe	-46.2%	-476.76	-65.64	-38.7%	-391.26	-53.82	-56.9%	-591.04	-81.50
Latin America/Caribbean	-40.1%	-59.99	-11.84	-33.5%	-49.11	-9.69	-49.7%	-74.78	-14.76
Middle East	-41.5%	-73.26	-13.30	-34.3%	-58.82	-10.67	-52.1%	-93.13	-16.92
North America	-41.3%	-83.68	-22.20	-34.7%	-68.61	-18.17	-51.1%	-104.09	-27.65
Total	**-43.7%**	**-987.02**	**-174.19**	**-36.5%**	**-804.97**	**-141.67**	**-54.2%**	**-1,235.57**	**-218.87**

Source: ICAO estimates

Estimated results by month: Scenario 2 compared to Baseline

Compared to Baseline (Originally-planned, business as usual)	**Scenario 2 (U-shaped) Path 2**			**Scenario 2 (U-shaped) Path 2a**			**Scenario 2 (U-shaped) Path 2b**		
Month	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
January 2020	-1.2%	0.00	0.19	-1.2%	0.00	0.19	-1.2%	0.00	0.19
February 2020	-10.3%	-20.67	-3.99	-10.3%	-20.67	-3.99	-10.3%	-20.67	-3.99
March 2020	-47.7%	-99.63	-17.68	-47.7%	-99.63	-17.68	-47.7%	-99.63	-17.68
April 2020	-94.3%	-159.22	-28.26	-94.3%	-159.22	-28.26	-94.3%	-159.22	-28.26
May 2020	-94.3%	-163.39	-28.75	-94.3%	-162.80	-28.64	-94.3%	-163.39	-28.75
June 2020	-94.4%	-176.59	-30.80	-94.4%	-176.59	-30.80	-94.4%	-177.19	-30.91
July 2020	-86.4%	-179.09	-31.27	-79.4%	-166.99	-29.14	-89.4%	-183.26	-32.00
August 2020	-74.4%	-160.17	-28.03	-54.4%	-124.65	-21.78	-84.4%	-177.10	-31.01
September 2020	-67.4%	-133.02	-23.21	-34.4%	-82.41	-14.34	-84.4%	-157.17	-27.44
October 2020	-62.4%	-116.89	-20.64	-24.4%	-57.38	-10.08	-79.4%	-144.27	-25.52
November 2020	-57.2%	-95.02	-17.43	-16.2%	-39.34	-7.16	-79.2%	-124.59	-22.89
December 2020	-52.2%	-96.98	-17.95	-10.2%	-34.29	-6.28	-79.2%	-133.73	-24.80
Total	**-63.6%**	**-1,400.65**	**-247.81**	**-48.6%**	**-1,123.97**	**-197.96**	**-71.5%**	**-1,540.22**	**-273.05**

Source: ICAO estimates

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Estimated results by month: Scenario 2 compared to 2019 (year-on-year)

Compared to 2019 (year-on-year)	Scenario 2 (U-shaped) Path 2			Scenario 2 (U-shaped) Path 2a			Scenario 2 (U-shaped) Path 2b		
Month	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
January 2020	1.8%	5.11	1.13	1.8%	5.11	1.13	1.8%	5.11	1.13
February 2020	-5.0%	-12.07	-2.51	-5.0%	-12.07	-2.51	-5.0%	-12.07	-2.51
March 2020	-44.6%	-90.33	-16.21	-44.6%	-90.33	-16.21	-44.6%	-90.33	-16.21
April 2020	-94.1%	-154.20	-27.40	-94.1%	-154.20	-27.40	-94.1%	-154.20	-27.40
May 2020	-94.2%	-158.47	-27.83	-94.2%	-157.88	-27.72	-94.2%	-158.47	-27.83
June 2020	-94.2%	-170.13	-29.72	-94.2%	-170.13	-29.72	-94.2%	-170.73	-29.83
July 2020	-86.0%	-173.11	-30.26	-78.8%	-161.01	-28.13	-89.1%	-177.28	-30.99
August 2020	-73.6%	-154.34	-27.00	-53.0%	-118.82	-20.75	-83.9%	-171.27	-29.98
September 2020	-66.5%	-128.13	-22.36	-32.5%	-77.52	-13.49	-84.0%	-152.28	-26.59
October 2020	-61.7%	-114.07	-20.11	-23.0%	-54.56	-9.55	-79.0%	-141.45	-24.99
November 2020	-56.3%	-92.28	-16.91	-14.5%	-36.60	-6.64	-78.8%	-121.85	-22.37
December 2020	-50.4%	-91.44	-16.98	-6.8%	-28.75	-5.31	-78.4%	-128.19	-23.83
Total	**-62.4%**	**-1,333.43**	**-236.16**	**-46.8%**	**-1,056.75**	**-186.31**	**-70.6%**	**-1,473.00**	**-261.40**

Source: ICAO estimates

Estimated results by region: Scenario 2 compared to Baseline

Compared to Baseline (Originally-planned, business as usual)	**Scenario 2 (U-shaped) Path 2**			**Scenario 2 (U-shaped) Path 2a**			**Scenario 2 (U-shaped) Path 2b**		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	-63.7%	-55.02	-11.76	-48.4%	-43.96	-9.37	-71.8%	-60.56	-12.96
Asia/Pacific	-63.0%	-380.38	-79.63	-47.8%	-302.82	-63.18	-71.1%	-420.04	-88.05
Europe	-66.3%	-667.42	-91.80	-51.3%	-540.38	-74.07	-74.1%	-730.66	-100.65
Latin America/Caribbean	-57.3%	-81.16	-16.01	-42.8%	-64.38	-12.69	-65.0%	-89.76	-17.71
Middle East	-62.1%	-107.73	-19.56	-47.0%	-85.88	-15.58	-70.1%	-118.80	-21.58
North America	-57.7%	-108.94	-29.04	-43.2%	-86.55	-23.06	-65.4%	-120.40	-32.09
Total	**-63.6%**	**-1,400.65**	**-247.81**	**-48.6%**	**-1,123.97**	**-197.96**	**-71.5%**	**-1,540.22**	**-273.05**

Source: ICAO estimates

Estimated results by region: Scenario 2 compared to 2019 (year-on-year)

Compared to 2019 (year-on-year)	Scenario 2 (U-shaped) Path 2			Scenario 2 (U-shaped) Path 2a			Scenario 2 (U-shaped) Path 2b		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	-60.8%	-49.24	-10.53	-44.4%	-38.18	-8.14	-69.5%	-54.78	-11.73
Asia/Pacific	-61.0%	-351.10	-73.40	-44.9%	-273.54	-56.95	-69.5%	-390.76	-81.82
Europe	-65.3%	-639.78	-88.22	-49.8%	-512.74	-70.49	-73.4%	-703.02	-97.07
Latin America/Caribbean	-57.2%	-80.71	-15.93	-42.7%	-63.93	-12.61	-64.9%	-89.31	-17.63
Middle East	-60.2%	-100.25	-18.22	-44.4%	-78.40	-14.24	-68.6%	-111.32	-20.24
North America	-58.6%	-112.36	-29.85	-44.4%	-89.97	-23.87	-66.2%	-123.82	-32.90
Total	**-62.4%**	**-1,333.43**	**-236.16**	**-46.8%**	**-1,056.75**	**-186.31**	**-70.6%**	**-1,473.00**	**-261.40**

Source: ICAO estimates

Appendix A: Situation Overview

COVID-19 outbreak has impacted air traffic of China starting from late 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/VariFlight (retrieved on 9 March 2020)

A surge of COVID-19 confirmed cases occurred in several States by late February 2020

January 2020	International passenger seat capacity	
Country/Territory	Capacity change from originally-planned	
Russian Federation	-89,778	-1%
Italy	-65,971	-1%
Turkey	-53,262	-1%
China	-45,484	0%
Morocco	-42,684	-2%
United Arab Emirates	-31,464	0%
Iraq	-29,326	-3%
Albania	-22,080	-7%
United Kingdom	-21,888	0%
South Africa	-21,476	-1%
Iran Islamic Republic of	-20,891	-2%
France	-19,537	0%
Poland	-18,154	0%
Romania	-17,493	-1%
Japan	-16,449	0%
United States	-13,067	0%
Indonesia	-12,114	0%
Bulgaria	-10,540	-1%
India	-10,342	0%
Cambodia	-10,158	-1%
Bahamas	-9,588	-2%
Denmark	-8,942	0%
Viet Nam	-8,489	0%
Malta	-7,372	-1%
Lebanon	-7,182	-1%
Bahrain	-7,123	-1%
Uzbekistan	-6,539	-1%
Tunisia	-6,362	-1%
Switzerland	-6,235	0%
Czechia	-5,642	0%

February 2020	International passenger seat capacity	
Country/Territory	Capacity change from originally-planned	
China	-10,532,219	-61%
Hong Kong SAR of China (CN)	-2,363,320	-36%
Republic of Korea	-1,717,147	-19%
Japan	-1,592,429	-15%
Thailand	-1,452,478	-15%
Taiwan, Province of China (CN)	-1,446,686	-23%
Singapore	-807,608	-12%
Viet Nam	-731,936	-16%
Macao SAR of China (CN)	-721,489	-64%
Philippines	-646,104	-18%
United States	-620,296	-3%
Malaysia	-448,172	-8%
Indonesia	-426,102	-10%
Russian Federation	-317,890	-5%
Cambodia	-307,968	-4%
Turkey	-277,868	-21%
Italy	-268,846	-3%
United Arab Emirates	-253,548	-2%
Australia	-241,284	-5%
United Kingdom	-188,864	-1%
Iran Islamic Republic of	-169,782	-18%
France	-157,998	-1%
Myanmar	-147,487	-21%
Germany	-145,561	-1%
India	-116,823	-2%
Morocco	-108,186	-5%
Qatar	-99,338	-2%
Canada	-96,231	-1%
Lao People's Democratic Republi	-71,910	-21%
Finland	-71,413	-4%

In February 2020, international passenger capacity **reduced by 10%**, mainly related to traffic from/to States experiencing an early outbreak and States deeply interconnected to China.

- State/Territory with 100 to 999 confirmed cases*
- State/Territory with 1,000 to 9,999 confirmed cases*
- State/Territory with 10,000 to 49,999 confirmed cases*
- State/Territory with 50,000 or more confirmed cases*

*: Coronavirus Disease 2019 (COVID-19) Situation Report by WHO (29 February 2020)

Source: OAG scheduled data adjusted by ICAO estimates

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COVID-19 Pandemic was declared and accelerating in March 2020

March 2020 International Passenger Capacity

Country/Territory	Capacity change from originally-planned	
China	-14,841,792	-82%
Italy	-6,860,837	-60%
Republic of Korea	-6,536,917	-70%
Japan	-5,837,894	-51%
Germany	-5,771,162	-31%
Hong Kong SAR of China (CN)	-5,352,855	-77%
United Kingdom	-4,965,296	-22%
United States	-4,950,969	-19%
Thailand	-4,587,421	-46%
Taiwan, Province of China (CN)	-4,074,431	-62%
Spain	-3,792,140	-26%
United Arab Emirates	-3,400,833	-26%
Singapore	-3,297,434	-45%
France	-3,216,482	-25%
Turkey	-2,879,271	-35%
Viet Nam	-2,599,336	-55%
Malaysia	-2,500,355	-42%
India	-2,077,578	-29%
Saudi Arabia	-1,747,385	-31%
Switzerland	-1,691,017	-28%

Country/Territory	Capacity change from originally-planned	
Philippines	-1,669,456	-45%
Indonesia	-1,466,518	-34%
Netherlands	-1,292,472	-17%
Canada	-1,218,383	-16%
Austria	-1,200,864	-30%
Russian Federation	-1,177,704	-19%
Australia	-1,119,345	-25%
Portugal	-1,118,941	-26%
Belgium	-1,060,572	-31%
Qatar	-1,041,439	-21%
Denmark	-980,211	-28%
Israel	-972,061	-44%
Poland	-967,520	-24%
Macao SAR of China (CN)	-954,453	-80%
Egypt	-818,043	-28%
Morocco	-762,145	-31%
Sweden	-761,425	-24%
Ireland	-733,678	-21%
Greece	-635,039	-34%
Czechia	-610,048	-37%

In March 2020, global international passenger capacity **reduced by 48%**, with significant reduction not only in States experiencing an early outbreak but also worldwide.

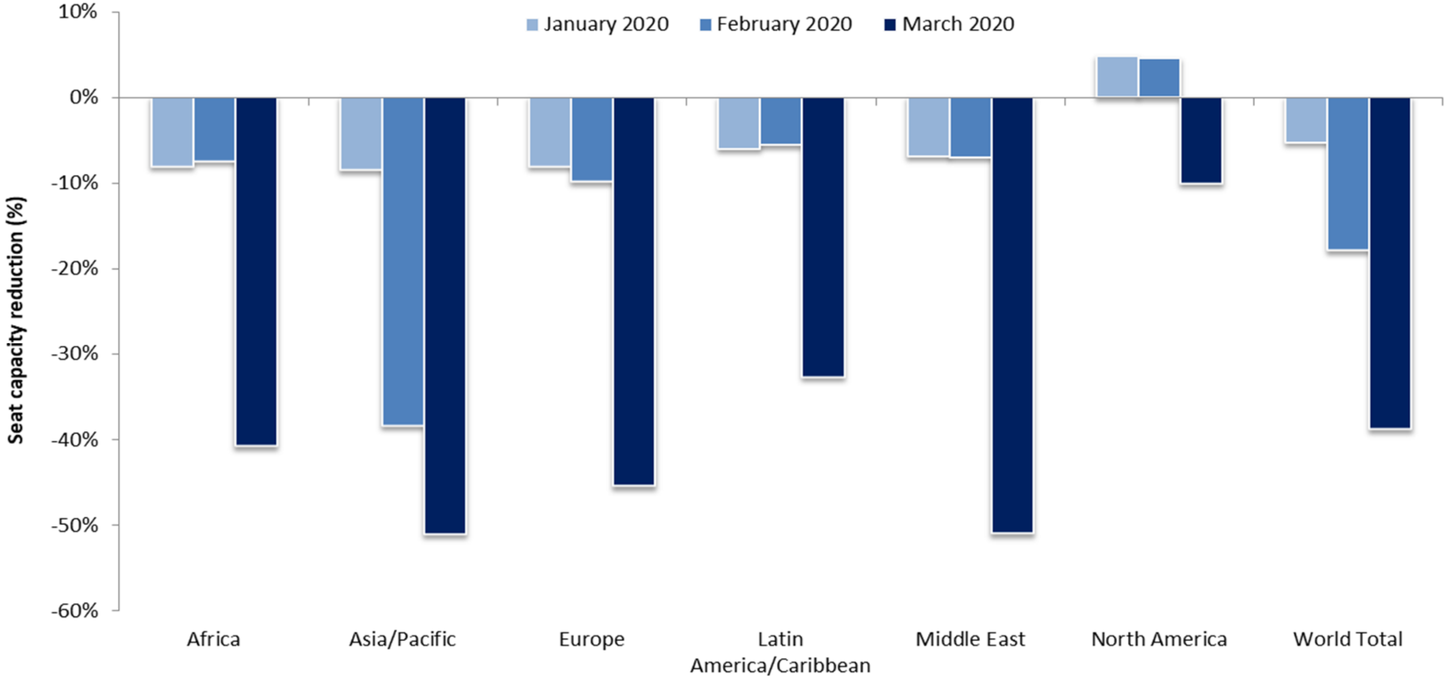
- State/Territory with 100 to 999 confirmed cases*
- State/Territory with 1,000 to 9,999 confirmed cases*
- State/Territory with 10,000 to 49,999 confirmed cases*
- State/Territory with 50,000 or more confirmed cases*

*: Coronavirus Disease 2019 (COVID-19) Situation Report by WHO (31 March 2020)

Source: OAG scheduled data adjusted by ICAO estimates

Air traffic reduction no longer limited to initial outbreak countries

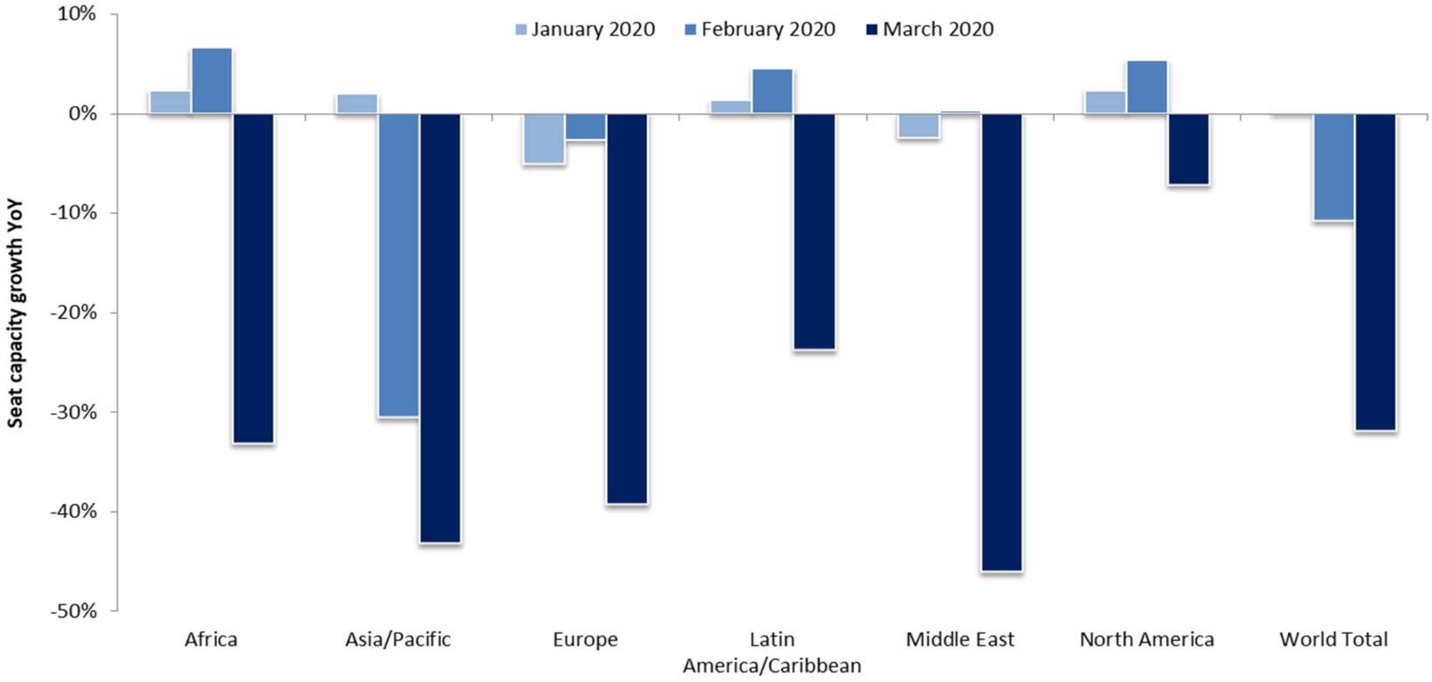
Monthly seat capacity change compare to originally-planned by region (total international and domestic)



Source: ICAO ADS-B operational data

Air traffic reduction no longer limited to initial outbreak countries (2)

Monthly seat capacity change compared to 2019 by region (total international and domestic)



Source: ICAO ADS-B operational data

Air freight volumes have also been declining

Total air cargo throughout declined by 19% in March 2020 YoY, with a significant withdraw of passenger aircraft belly cargo capacity while the increase in all-cargo freighters have offset the capacity reduction

Millions of Tonnes Transported

	March 2019	March 2020	Change
Belly Cargo	3.49	2.40	-31%
Freighter Cargo	1.48	1.61	9%
Net	**4.97**	**4.01**	**-19%**

Preliminary analysis indicates air cargo revenues have dropped 22% from USD 8.3 to 6.5 billion in March 2020 over the same period

Source: ICAO ADS-B data and ICAO Statistical Reporting

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The world reached 1 million confirmed COVID-19 cases in April 2020

April 2020 International Passenger Capacity

Country/Territory	Capacity change from originally-planned	
United States	-22,976,621	-88%
United Kingdom	-22,345,210	-90%
Germany	-19,374,444	-92%
Spain	-18,041,897	-94%
China	-16,683,876	-95%
France	-13,480,021	-91%
Italy	-12,464,502	-94%
United Arab Emirates	-11,009,896	-89%
Japan	-9,501,833	-88%
Turkey	-8,798,224	-94%
Thailand	-8,441,105	-94%
Republic of Korea	-7,960,525	-86%
Hong Kong SAR of China (CN)	-7,122,206	-93%
Netherlands	-6,960,693	-89%
Singapore	-6,596,279	-93%
Canada	-6,288,656	-90%
India	-6,286,458	-89%
Switzerland	-5,990,424	-93%
Russian Federation	-5,747,918	-87%
Taiwan, Province of China (CN)	-5,400,277	-85%

Country/Territory	Capacity change from originally-planned	
Malaysia	-4,959,606	-85%
Portugal	-4,913,803	-95%
Saudi Arabia	-4,193,572	-77%
Australia	-4,115,805	-92%
Mexico	-4,104,882	-78%
Austria	-3,812,866	-91%
Qatar	-3,760,492	-80%
Indonesia	-3,723,583	-87%
Viet Nam	-3,681,731	-89%
Ireland	-3,595,318	-92%
Poland	-3,449,632	-79%
Denmark	-3,417,729	-93%
Belgium	-3,323,135	-87%
Greece	-3,078,774	-94%
Philippines	-2,993,741	-86%
Sweden	-2,941,579	-89%
Norway	-2,476,519	-90%
Egypt	-2,248,437	-78%
Brazil	-2,214,850	-92%
Israel	-2,196,238	-91%

In April 2020, global international passenger capacity so far experienced by **unprecedented 94% reduction** (estimated)

State/Territory with 100 to 999 confirmed cases*

State/Territory with 1,000 to 9,999 confirmed cases*

State/Territory with 10,000 to 49,999 confirmed cases*

State/Territory with 50,000 or more confirmed cases*

*: Coronavirus Disease 2019 (COVID-19) Situation Report by WHO (26 April 2020)

Source: OAG scheduled data adjusted by ICAO estimates

Appendix B: Summary of Analysis by Other Organizations

ACI: Airport would lose USD 76 billion revenues in 2020

Region	**Passenger number** - both interntional and domestic for full year 2020		**Airport revenue** - both aeronautical and non-aeronautical for full year 2020	
	million and % change from 2020 "business as usual" baseline scenario		USD billion and % change from 2020 "business as usual" baseline scenario	
Africa	-77	-32.5%	-1.5	-35%
Asia/Pacific	-1,465	-42.1%	-23.9	-48%
Europe	-894	-35.0%	-24.6	-42%
Latin America/Caribbean	-244	-34.0%	-4.0	-38%
Middle East	-157	-36.5%	-5.7	-43%
North America	-790	-37.7%	-16.9	-49%
Total	**-3,627**	**-38.1%**	**-76.6**	**-45%**

https://aci.aero/wp-content/uploads/2020/03/200401-COVID19-Economic-Impact-Bulletin-FINAL-1.pdf

Source: The Impact of COVID-19 on the Airport Business (dated 1 April 2020)

IATA: Airlines would lose USD 314 billion revenues under "3-month lock-down + recession" scenario

The analytical difference between ICAO and IATA estimates:

- **Traffic**: international only (ICAO) vs. both international and domestic (IATA)
- **Regional break-down**: by all traffic from States in each region (ICAO) vs. region of airline registration (IATA)
- **Baseline**: originally-planned i.e. 2020 business as usual scenario (ICAO) vs. 2019 level with 2020 airline schedules (IATA)

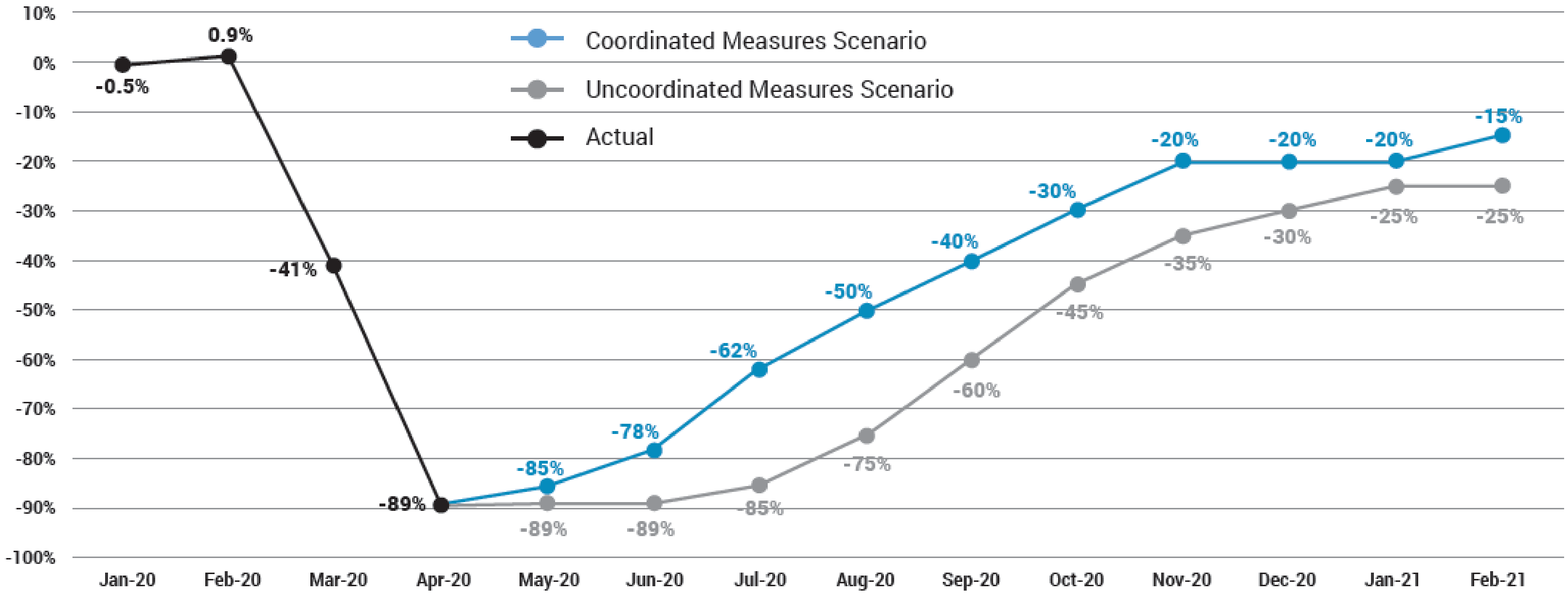
Region of airline registration	**Revenue Passenger Kilometres (RPKs)** - both interntional and domestic for full year 2020	**Gross passenger revenue** - both interntional and domestic for full year 2020
	year-on-year % change from 2019 level	USD billion, compared to 2019 level
Africa	-51%	-6
Asia/Pacific	-50%	-113
Europe	-55%	-89
Latin America/Caribbean	-49%	-18
Middle East	-51%	-24
North America	-36%	-64
Total	**-48%**	**-314**

https://www.iata.org/en/iata-repository/publications/economic-reports/covid-fourth-impact-assessment/

Source: IATA COVID-19 Updated Impact Assessment (dated 14 April 2020)

EUOCONTROL: A loss of € 110 billion for airlines, airports and ANSPs in Europe in 2020

EUROCONTROL Draft Traffic Scenarios - 24 April 2020 (base year 2019)



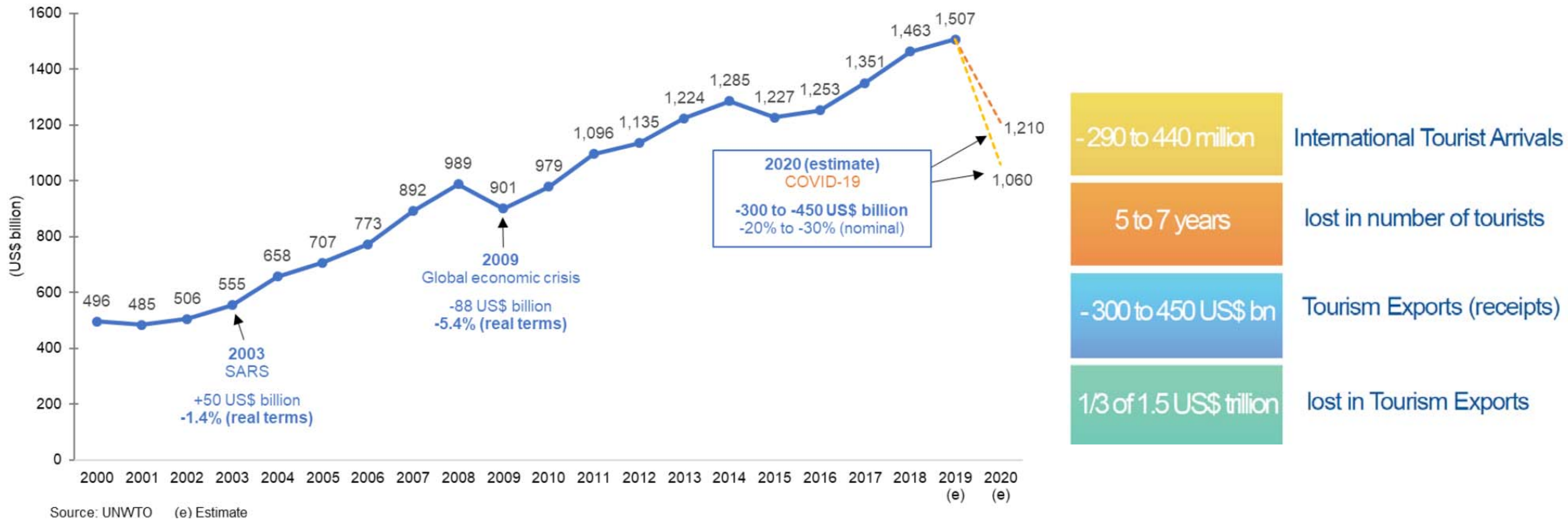
The Coordinated Measures Scenario envisages a loss of 45% of flights (5 million) in 2020, while the Uncoordinated Measures Scenario would result in the loss of 57% of flights (6.2 million).

https://www.eurocontrol.int/covid19#traffic-scenarios

Source: COVID-19 Impact on the European Air Traffic Network (EUROCONTROL)

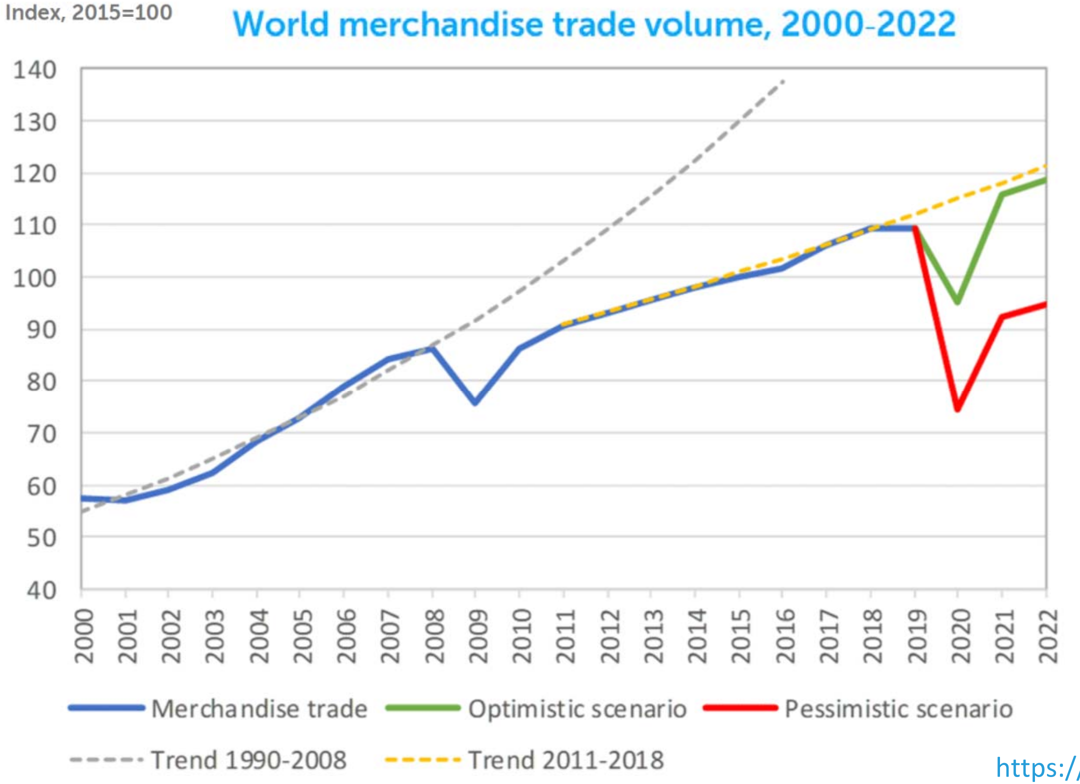
UNWTO: A loss of USD 300 to 450 billion in international tourism receipts in 2020

2020 forecast - international tourism receipts, world (US$ billion)



https://www.unwto.org/news/international-tourism-arrivals-could-fall-in-2020

WTO: Global trade falling by 13 to 32% in 2020



- **World merchandise trade is set to plummet by between 13 and 32% in 2020** due to the COVID-19 pandemic.
- **A 2021 recovery** in trade is expected, but dependent on the duration of the outbreak and the effectiveness of the policy responses.
- **Nearly all regions will suffer double-digit declines in trade volumes in 2020**, with exports from North America and Asia hit hardest.

https://www.wto.org/english/news_e/pres20_e/pr855_e.htm

Source: Press release of World Trade Organization (WTO) dated 8 April 2020

IMF: Global economy is projected to contract sharply by -3% in 2020

The Projections assume that the pandemic fades in the second half of 2020 and containment efforts can be gradually unwound

(real GDP, annual percent change)	2019	2020	2021
World Output	**2.9**	**-3.0**	**5.8**
Advanced Economies	**1.7**	**-6.1**	**4.5**
United States	2.3	-5.9	4.7
Euro Area	1.2	-7.5	4.7
Germany	0.6	-7.0	5.2
France	1.3	-7.2	4.5
Italy	0.3	-9.1	4.8
Spain	2.0	-8.0	4.3
Japan	0.7	-5.2	3.0
United Kingdom	1.4	-6.5	4.0
Canada	1.6	-6.2	4.2
Other Advanced Economies	1.7	-4.6	4.5

(real GDP, annual percent change)	2019	2020	2021
Emerging Markets and Developing Economies	**3.7**	**-1.0**	**6.6**
Emerging and Developing Asia	5.5	1.0	8.5
China	6.1	1.2	9.2
India	4.2	1.9	7.4
ASEAN-5	4.8	-0.6	7.8
Emerging and Developing Europe	2.1	-5.2	4.2
Russia	1.3	-5.5	3.5
Latin America and the Caribbean	0.1	-5.2	3.4
Brazil	1.1	-5.3	2.9
Mexico	-0.1	-6.6	3.0
Middle East and Central Asia	1.2	-2.8	4.0
Saudi Arabia	0.3	-2.3	2.9
Sub-Saharan Africa	3.1	-1.6	4.1
Nigeria	2.2	-3.4	2.4
South Africa	0.2	-5.8	4.0
Low-Income Developing Countries	5.1	0.4	5.6

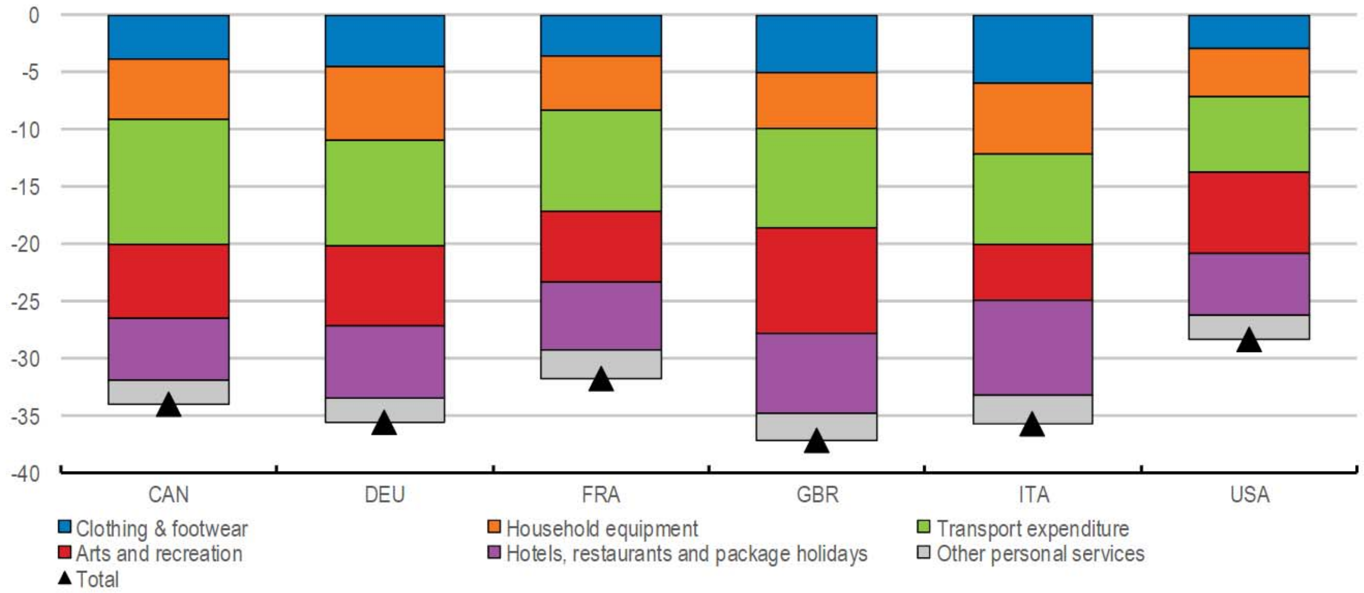
https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020

Source: IMF Word Economic Outlook (April 2020)

OECD: Sharp decrease in consumers' expenditures for air travel due to containment measures

The potential initial impact of partial or complete shutdowns on private consumption in selected G7 economies

Per cent of total consumers' expenditure



Source: OECD Evaluating the Initial Impact of Containment Measures (27 March 2020)

Appendix C: Airlines’ Financial Analysis

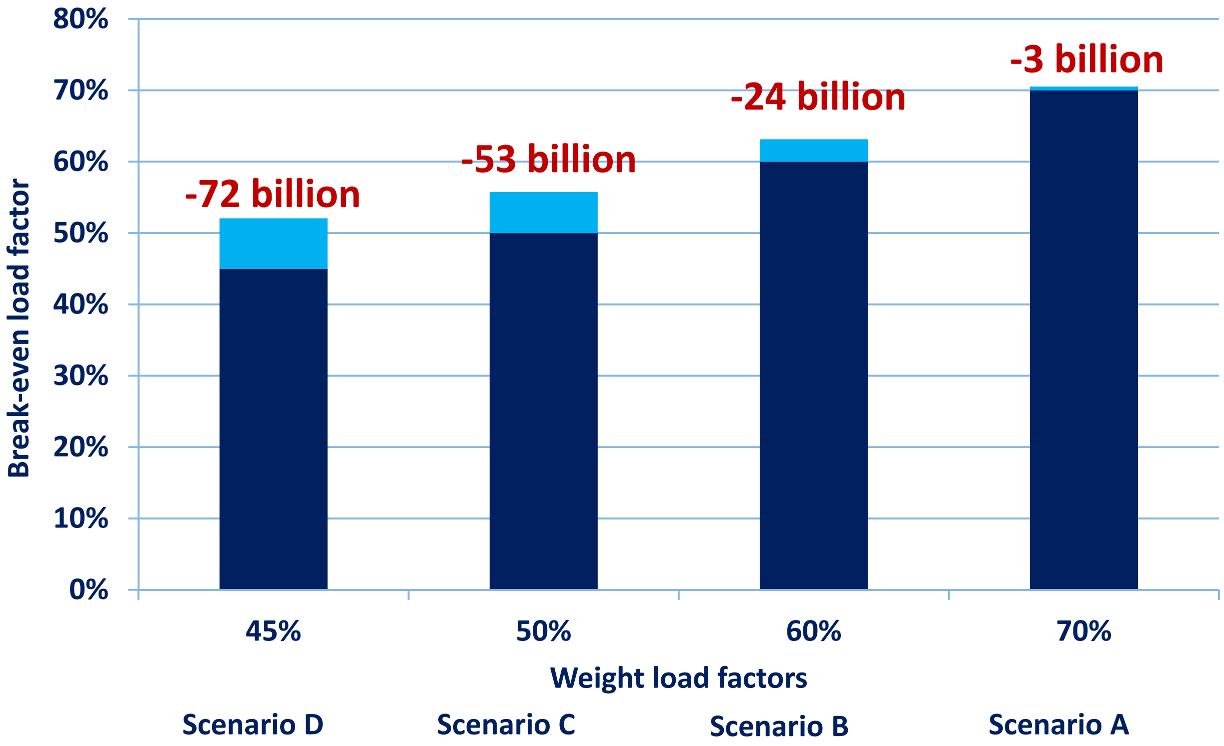
Figures and estimates herein is subject to substantial changes, and will be updated with the situation evolving and more information available.

Break-even weight load factor

Scenarios are based on the assumption that air traffic, measured in Revenue Tonnes-Kilometres (RTKs, both international and domestic), will **decrease by 50% in 2020** compared to 2019

	Scenario A **Weight load factor = 70%**	**Scenario B** **Weight load factor = 60%**	**Scenario C** **Weight load factor = 50%**	**Scenario D** **Weight load factor = 45%**
	Load factor remains high, rebound of demand in Q3 and Q4 with severe capacity cuts	Load factor moderate-high and rebound during Q4, with capacity cuts in all regions	Low load factor and moderate return of normal capacity in Q3 and Q4	Low load factors (social distancing) and airlines increase capacity in Q2 2020
Total capacity reduction	-51%	-42%	-31%	-23%
Fuel costs (USD, billion) *Oil price: 49% decrease compared to 2019 levels*	46	54	65	72
Break-even weight load factor *(excluding depreciation and amortization costs)*	70.5%	63.1%	55.8%	52.1%

Airlines close to break even as load factor increases

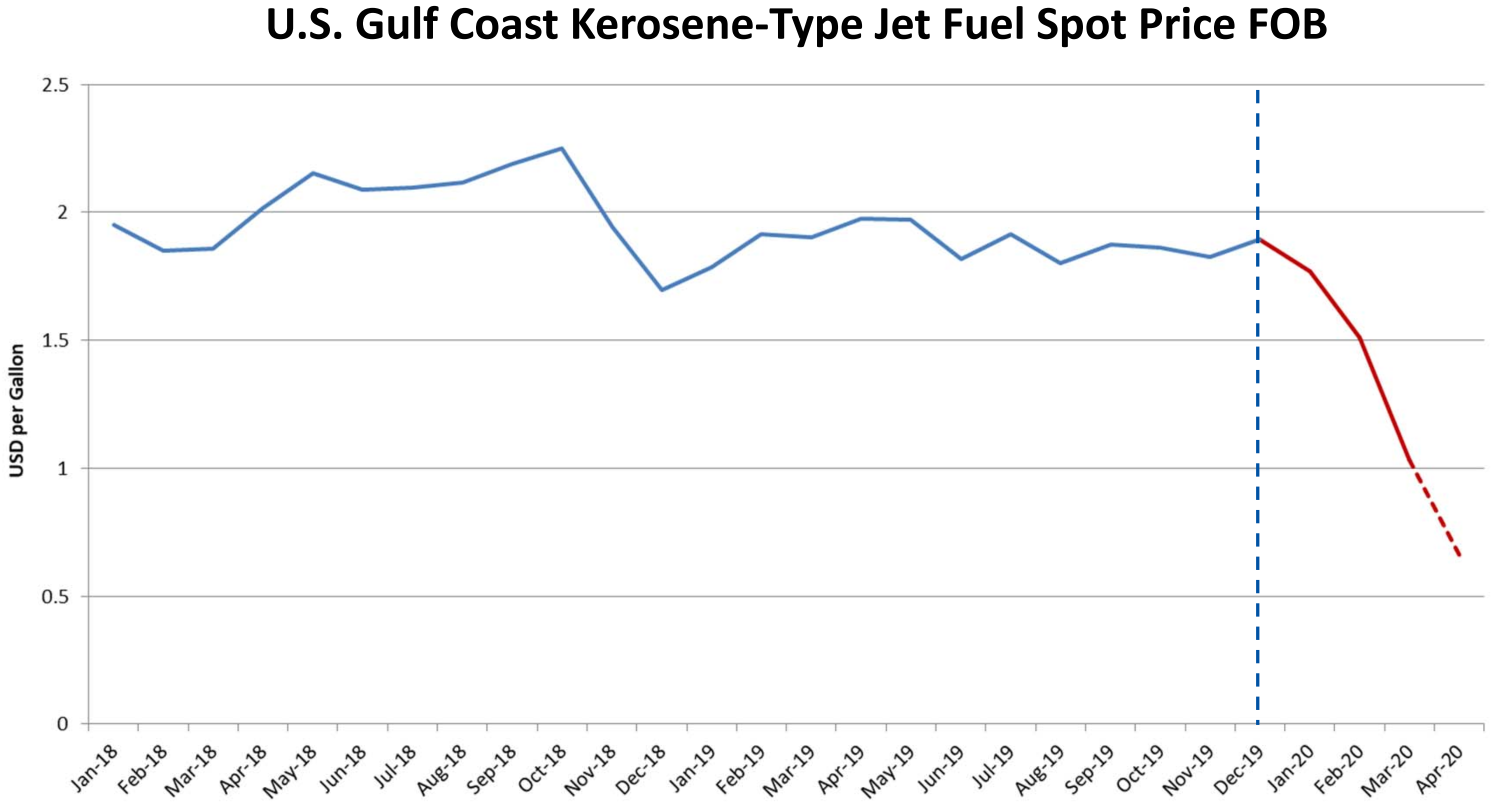


Operating loss
Excluding depreciation and amortizations costs

Difference between load factor and break-even load factors in each scenario

Source: ICAO estimates based on ICAO Statistical Reporting

Jet fuel price is estimated to go down 49% annually compared to 2019



Source: EIA Jet Fuel Tracker and estimates

Appendix D: Route Group Level Analysis

The analysis will be updated and expanded with the situation evolving and more information available.

Estimated results by route group for 1Q 2020 (compared to Baseline)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Africa	Domestic	-11%	-8%	-36%	-447	-472	-2,258	-40	-42	-202
Africa - Asia/Pacific	International	4%	-19%	-46%	18	-118	-253	10	-65	-140
Africa - Middle East	International	-6%	-7%	-56%	132	68	-1,558	29	15	-341
Africa - North America	International	-9%	-3%	-26%	-9	1	-97	-6	1	-71
Africa & Middle East - Central America/Caribbean	International	0%	0%	0%	0	0	0	0	0	0
Africa & Middle East - South America	International	2%	5%	-22%	6	-6	-57	3	-2	-24
Central America/Caribbean	Domestic	-8%	-7%	-25%	-442	-366	-2,565	-37	-31	-216
Central America/Caribbean - Europe	International	-1%	1%	-19%	10	-12	-664	3	-4	-227
Central America/Caribbean - North America	International	5%	4%	-18%	396	336	-4,012	62	53	-630
Central America/Caribbean - South America	International	5%	10%	-26%	59	102	-581	11	19	-106
China	Domestic	-13%	-76%	-62%	-10,181	-48,337	-39,169	-624	-2,962	-2,400
China - Europe	International	2%	-52%	-74%	47	-966	-1,616	14	-293	-490
China - Middle East	International	5%	-57%	-77%	41	-334	-496	10	-82	-121
China - North America	International	3%	-45%	-66%	38	-697	-1,137	15	-280	-456
China & South West Asia - North Asia	International	-1%	-44%	-84%	-145	-3,529	-6,066	-26	-628	-1,079
China & South West Asia - Pacific South East Asia	International	-2%	-47%	-72%	-405	-5,807	-8,400	-88	-1,257	-1,818
Europe	Domestic	-10%	-12%	-41%	-2,145	-3,170	-16,109	-278	-410	-2,085
Europe - Middle East	International	1%	-1%	-44%	370	23	-4,690	68	4	-863

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

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Estimated results by route group for 1Q 2020 (compared to Baseline)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Europe - North Africa	International	0%	1%	-39%	70	-11	-2,004	10	-2	-295
Europe - North America	International	5%	5%	-33%	418	209	-3,490	131	66	-1,095
Europe - North Asia	International	5%	4%	-41%	51	-23	-589	24	-11	-276
Europe - Pacific South East Asia	International	-3%	-1%	-14%	-50	-128	-681	-25	-64	-340
Europe - South America	International	-6%	-6%	-37%	-60	-90	-794	-21	-32	-284
Europe - South West Asia	International	1%	2%	-37%	32	-86	-1,087	9	-23	-293
Europe - Sub Saharan Africa	International	2%	3%	-27%	105	39	-898	44	17	-380
Intra Africa	International	-10%	-11%	-44%	-146	-217	-1,521	-19	-28	-199
Intra Central America/Caribbean	International	4%	4%	-26%	53	35	-692	4	3	-58
Intra China & South West Asia	International	-10%	-61%	-79%	-562	-3,108	-4,123	-72	-395	-525
Intra Europe	International	-2%	-4%	-47%	-291	-2,339	-32,619	-30	-238	-3,321
Intra Middle East	International	-6%	-6%	-68%	68	-22	-2,754	8	-3	-315
Intra North America	International	3%	3%	-24%	119	61	-1,428	16	8	-191
Intra North Asia	International	-2%	-3%	-79%	-40	-226	-1,103	-2	-12	-59
Intra Pacific South East Asia	International	-1%	-6%	-46%	-189	-1,655	-5,127	-28	-246	-763
Intra South America	International	-10%	-7%	-40%	-215	-153	-1,052	-37	-27	-183
Latin America/Caribbean - China	International	5%	0%	0%	0	0	0	0	0	0
Latin America/Caribbean - North Asia & Pacific South East	International	3%	0%	-18%	1	-9	-33	1	-6	-22

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

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Estimated results by route group for 1Q 2020 (compared to Baseline)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Middle East	Domestic	-11%	-6%	-45%	-220	-206	-2,178	-20	-19	-203
Middle East - North America	International	2%	3%	-27%	73	63	-360	34	30	-171
Middle East - North Asia & Pacific South East Asia	International	-2%	-2%	-36%	0	-310	-1,398	0	-83	-374
Middle East - South West Asia	International	-3%	-2%	-44%	-89	-584	-3,011	-14	-92	-476
North America	Domestic	5%	5%	-7%	4,856	4,268	-27,162	564	496	-3,153
North America - North Asia	International	5%	5%	-24%	60	-97	-641	19	-30	-202
North America - Pacific South East Asia	International	4%	6%	-18%	27	-50	-314	21	-39	-250
North America - South America	International	5%	5%	-24%	70	62	-669	28	25	-263
North America - South West Asia	International	4%	5%	-28%	6	-14	-99	4	-11	-73
North Asia	Domestic	-2%	-4%	-21%	-69	-1,202	-5,585	-4	-74	-342
North Asia - Pacific South East Asia	International	0%	-8%	-64%	-69	-1,080	-3,518	-18	-279	-909
Pacific South East Asia	Domestic	-11%	-11%	-33%	-2,645	-3,680	-15,360	-162	-226	-941
South America	Domestic	-10%	-10%	-41%	-1,591	-1,752	-9,571	-134	-148	-808
South West Asia	Domestic	-14%	-14%	-38%	-2,488	-2,480	-8,993	-152	-152	-551
Domestic		-6%	-21%	-32%	-15,372	-57,397	-128,951	-888	-3,568	-10,902
International		-1%	-10%	-48%	3	-20,672	-99,630	195	-3,994	-17,685
Total		-4%	-17%	-38%	-15,370	-78,068	-228,580	-694	-7,562	-28,586

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

Estimated results by route group for 1Q 2020 (compared to 1Q 2019 year-on-year)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Africa	Domestic	5%	10%	-25%	140	129	-1,705	13	12	-152
Africa - Asia/Pacific	International	18%	-1%	-35%	69	-47	-182	38	-26	-101
Africa - Middle East	International	7%	10%	-50%	442	385	-1,245	97	84	-273
Africa - North America	International	8%	22%	-10%	23	37	-61	17	27	-45
Africa & Middle East - Central America/Caribbean	International	0%	-100%	0%	0	0	0	0	0	0
Africa & Middle East - South America	International	-6%	2%	-26%	-4	-9	-64	-2	-4	-27
Central America/Caribbean	Domestic	8%	12%	-12%	397	462	-1,784	34	39	-151
Central America/Caribbean - Europe	International	-2%	3%	-17%	1	20	-623	0	7	-213
Central America/Caribbean - North America	International	0%	4%	-22%	40	337	-4,343	6	53	-682
Central America/Caribbean - South America	International	4%	8%	-25%	40	87	-562	7	16	-103
China	Domestic	-4%	-73%	-57%	-4,949	-42,659	-33,436	-303	-2,614	-2,049
China - Europe	International	4%	-49%	-72%	90	-855	-1,475	27	-259	-448
China - Middle East	International	6%	-56%	-76%	50	-331	-487	12	-81	-119
China - North America	International	-6%	-48%	-70%	-102	-780	-1,317	-41	-313	-529
China & South West Asia - North Asia	International	22%	-32%	-81%	1,218	-2,350	-4,762	217	-418	-847
China & South West Asia - Pacific South East Asia	International	7%	-46%	-70%	615	-5,393	-7,717	133	-1,167	-1,670
Europe	Domestic	-3%	-2%	-35%	-280	-602	-13,514	-36	-78	-1,749
Europe - Middle East	International	5%	6%	-40%	670	463	-4,156	123	85	-765

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

Estimated results by route group for 1Q 2020 (compared to 1Q 2019 year-on-year)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Europe - North Africa	International	-1%	6%	-40%	75	158	-2,050	11	23	-302
Europe - North America	International	-1%	4%	-35%	102	185	-3,609	32	58	-1,133
Europe - North Asia	International	4%	6%	-39%	48	-5	-552	22	-2	-259
Europe - Pacific South East Asia	International	5%	7%	-15%	110	-5	-697	55	-3	-348
Europe - South America	International	-3%	0%	-34%	-13	-13	-719	-5	-5	-257
Europe - South West Asia	International	-8%	-4%	-40%	-159	-196	-1,193	-43	-53	-322
Europe - Sub Saharan Africa	International	1%	5%	-24%	74	82	-828	31	35	-351
Intra Africa	International	2%	5%	-36%	156	126	-1,202	20	16	-157
Intra Central America/Caribbean	International	1%	4%	-27%	8	44	-706	1	4	-59
Intra China & South West Asia	International	-2%	-57%	-77%	-125	-2,678	-3,670	-16	-341	-467
Intra Europe	International	-1%	3%	-42%	843	1,076	-28,358	86	110	-2,887
Intra Middle East	International	-2%	0%	-65%	226	174	-2,408	26	20	-276
Intra North America	International	-4%	-1%	-26%	-68	-19	-1,515	-9	-3	-202
Intra North Asia	International	-32%	-31%	-84%	-628	-718	-1,555	-34	-39	-84
Intra Pacific South East Asia	International	7%	2%	-40%	509	-1,070	-4,403	76	-159	-656
Intra South America	International	-9%	-4%	-37%	-203	-77	-969	-35	-13	-168
Latin America/Caribbean - China	International	-66%	-100%	-100%	-6	-8	-8	-4	-6	-6
Latin America/Caribbean - North Asia & Pacific South East	International	3%	1%	-15%	1	-9	-30	1	-6	-20

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

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Estimated results by route group for 1Q 2020 (compared to 1Q 2019 year-on-year)

Route Group	DOM/INT	Seat capacity			Scheduled passenger (thousand)			Gross revenue (USD, million)		
		Jan 2020	Feb 2020	Mar 2020	Jan 2020	Feb 2020	Mar 2020*	Jan 2020	Feb 2020	Mar 2020*
Middle East	Domestic	-7%	1%	-43%	-62	36	-2,041	-6	3	-190
Middle East - North America	International	5%	7%	-24%	93	87	-328	44	41	-156
Middle East - North Asia & Pacific South East Asia	International	0%	3%	-33%	35	-186	-1,271	9	-50	-340
Middle East - South West Asia	International	3%	9%	-39%	228	-96	-2,568	36	-15	-406
North America	Domestic	3%	6%	-8%	3,765	5,242	-27,870	437	609	-3,236
North America - North Asia	International	4%	5%	-26%	44	-94	-666	14	-30	-210
North America - Pacific South East Asia	International	6%	13%	-14%	48	-4	-282	38	-3	-225
North America - South America	International	-8%	-3%	-31%	-127	-33	-798	-50	-13	-315
North America - South West Asia	International	20%	24%	-15%	34	14	-68	25	11	-50
North Asia	Domestic	6%	6%	-11%	776	-128	-4,228	48	-8	-259
North Asia - Pacific South East Asia	International	16%	9%	-58%	659	-367	-2,882	170	-95	-744
Pacific South East Asia	Domestic	6%	8%	-21%	1,781	999	-10,958	109	61	-672
South America	Domestic	2%	4%	-29%	580	475	-6,904	49	40	-583
South West Asia	Domestic	1%	7%	-23%	109	694	-5,716	7	43	-350
Domestic		1%	-13%	-26%	2,256	-35,353	-108,155	350	-1,894	-9,390
International		2%	-5%	-45%	5,116	-12,069	-90,329	1,138	-2,514	-16,218
Total		1%	-10%	-34%	7,372	-47,422	-198,484	1,488	-4,407	-25,608

Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO Statistical Reporting, IATA Economics, and IMF Economic Outlook

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