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

Montréal, Canada
6 May 2020
Air Transport Bureau

Contents

Executive Summary: Economic Impact in Brief

Figures and estimates herein are 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 **38% to 55% of seats offered by airlines**
- Overall reduction of **861 to 1,292 million passengers**
- Approx. **USD 151 to 228 billion potential loss** of gross operating revenues of airlines

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

- Overall reduction ranging from **48% to 71% of seats offered by airlines**
- Overall reduction of **1,108 to 1,524 million passengers**
- Approx. **USD 194 to 269 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.

International passenger traffic collapses with unprecedented decline in history

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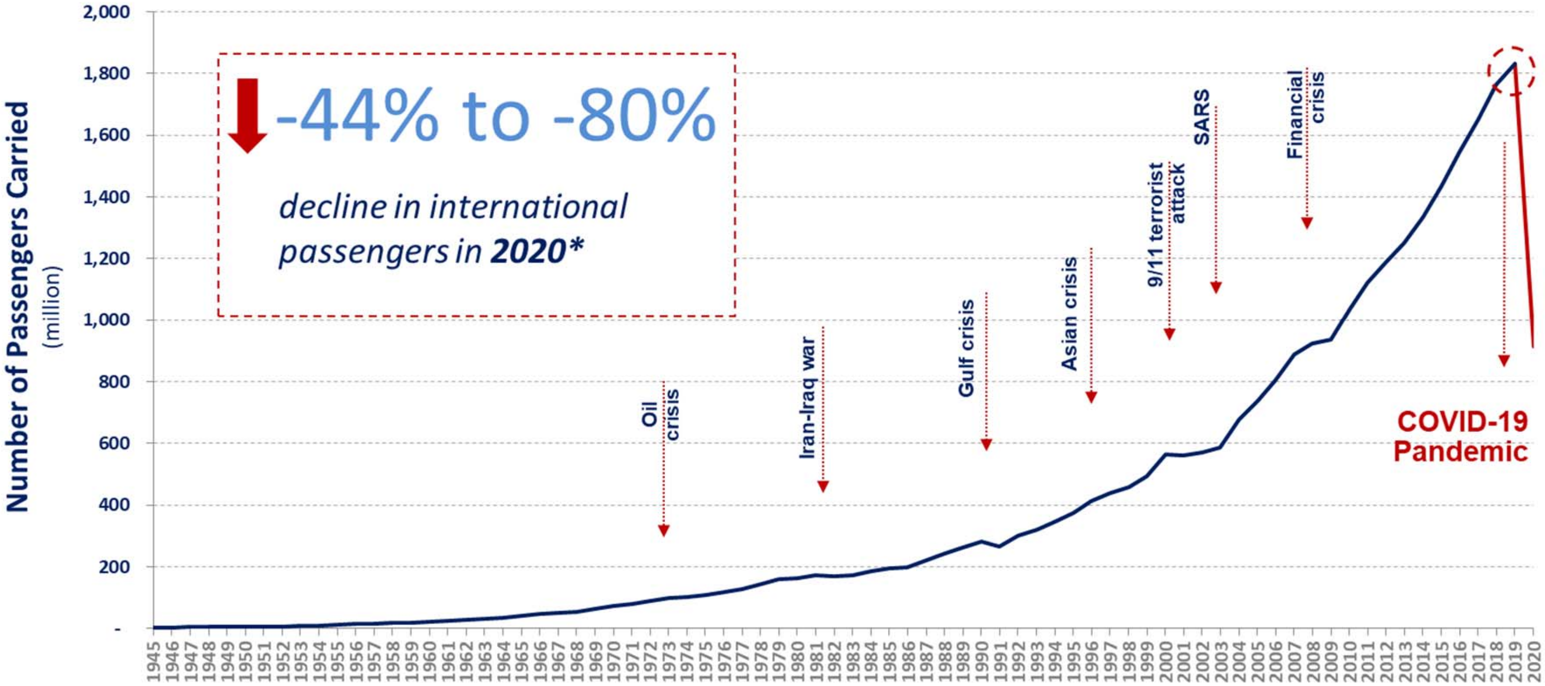
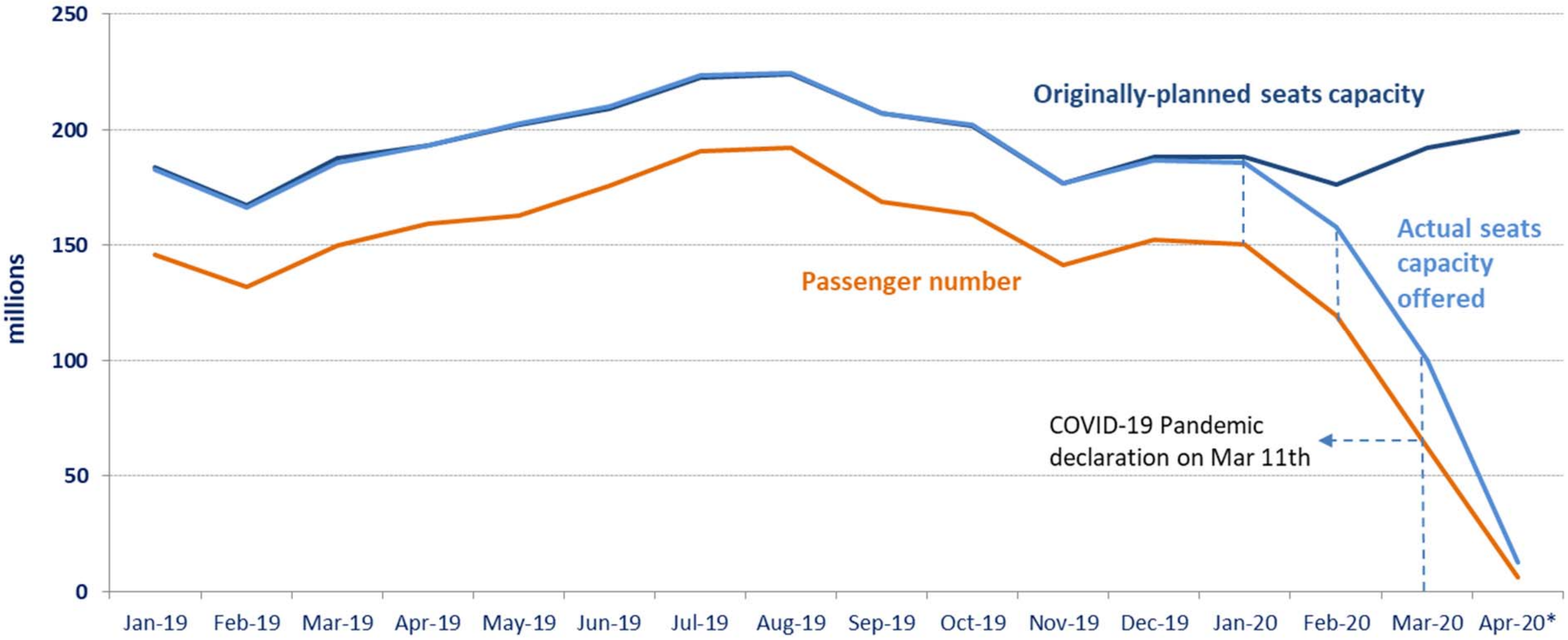
World international passenger traffic evolution 1945 – 2020*



Drastic capacity cut along with dramatic drop in demand

Comparison of international passenger numbers and capacity



Source: ICAO ADS-B and OAG plus estimates

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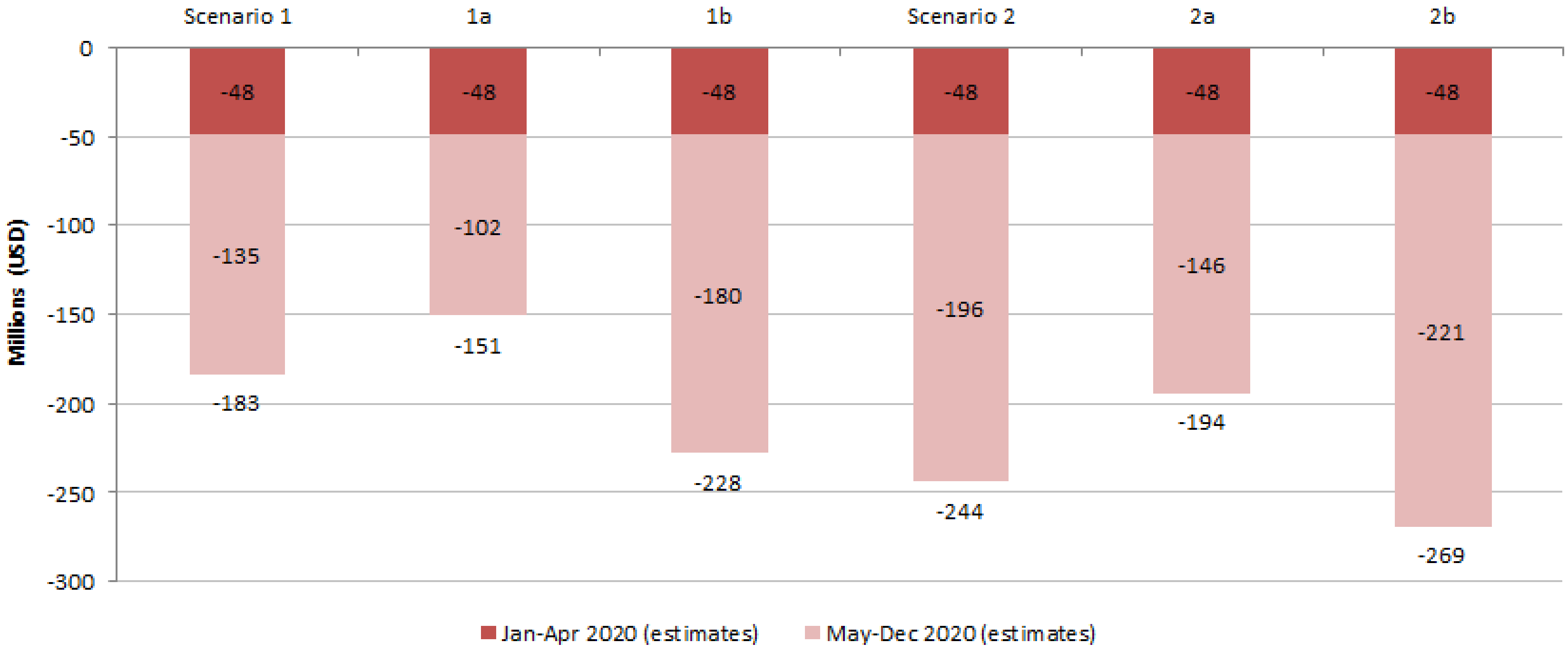
Approximately USD 48 billion international passenger revenue loss from Jan to Apr 2020



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

Source: ICAO estimates

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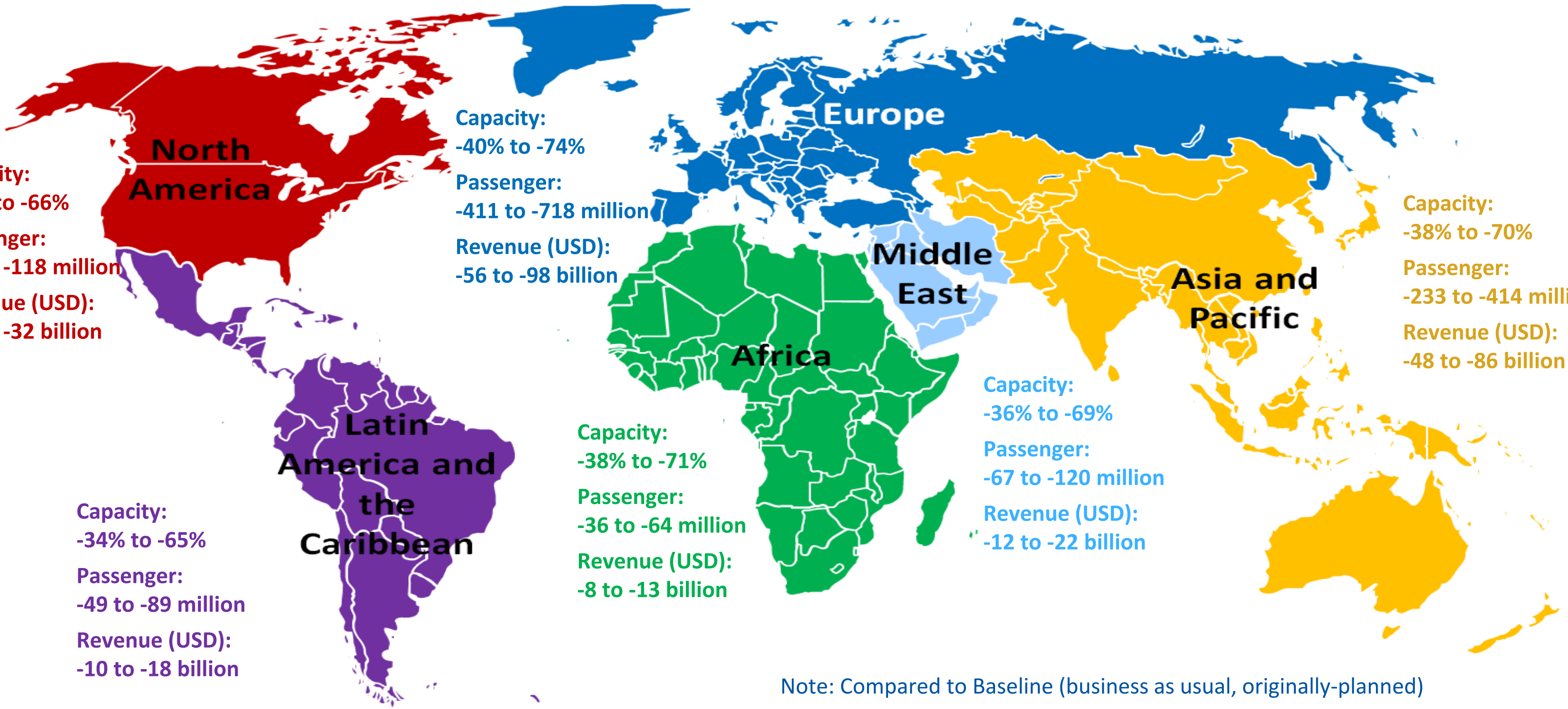
Estimated impact on international passenger traffic and revenues by region for 2020



North America
Capacity:
-34% to -66%
Passenger:
-65 to -118 million
Revenue (USD):
-17 to -32 billion

Europe
Capacity:
-40% to -74%
Passenger:
-411 to -718 million
Revenue (USD):
-56 to -98 billion

Asia and Pacific
Capacity:
-38% to -70%
Passenger:
-233 to -414 million
Revenue (USD):
-48 to -86 billion

Middle East
Capacity:
-36% to -69%
Passenger:
-67 to -120 million
Revenue (USD):
-12 to -22 billion

Africa
Capacity:
-38% to -71%
Passenger:
-36 to -64 million
Revenue (USD):
-8 to -13 billion

Latin America and the Caribbean
Capacity:
-34% to -65%
Passenger:
-49 to -89 million
Revenue (USD):
-10 to -18 billion

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

Source: ICAO estimates

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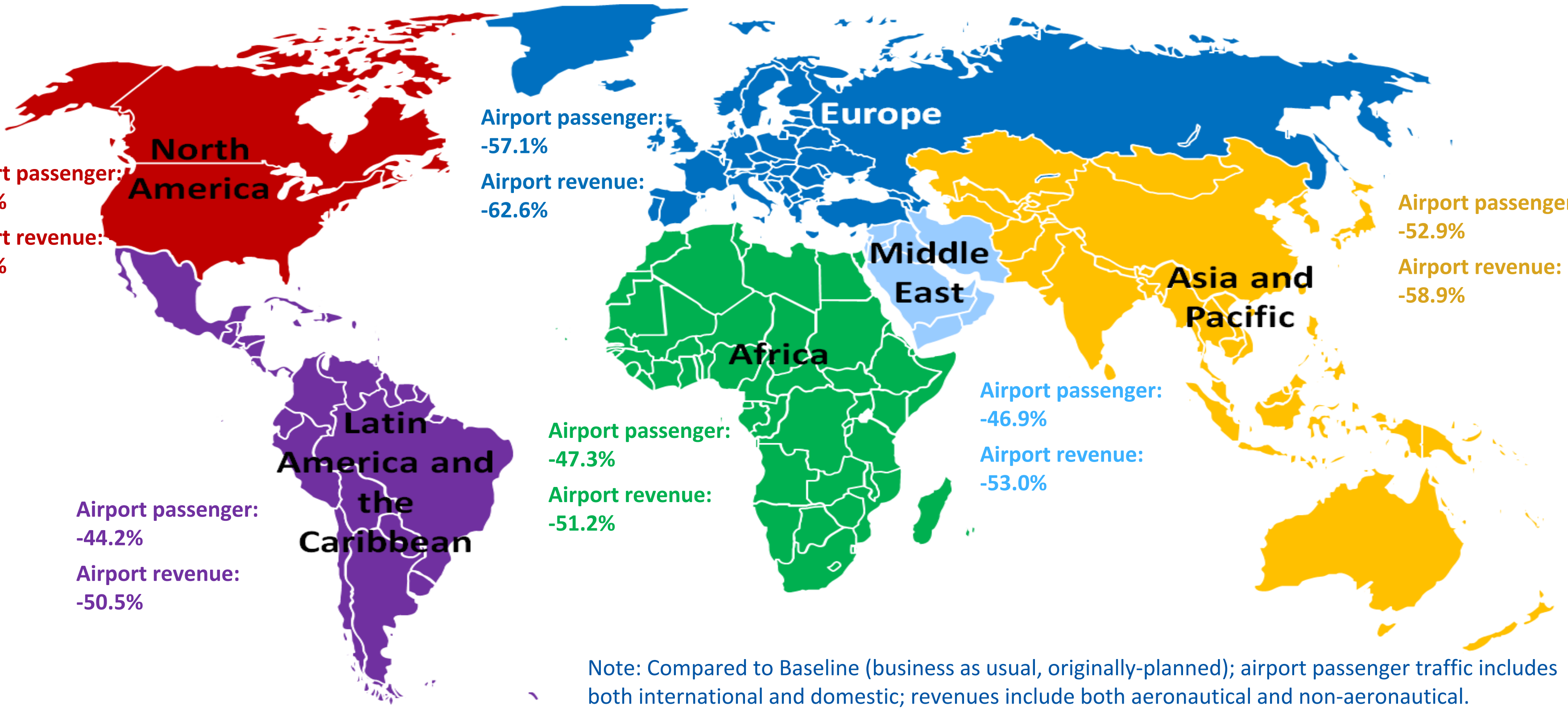
Estimated impact on airport passenger traffic and revenues by region for 2020 (by ACI)



North America
Airport passenger: -41.1%
Airport revenue: -47.3%

Europe
Airport passenger: -57.1%
Airport revenue: -62.6%

Asia and Pacific
Airport passenger: -52.9%
Airport revenue: -58.9%

Middle East
Airport passenger: -46.9%
Airport revenue: -53.0%

Africa
Airport passenger: -47.3%
Airport revenue: -51.2%

Latin America and the Caribbean
Airport passenger: -44.2%
Airport revenue: -50.5%

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 Advisory Bulletin – Economic Impact Assessment of COVID-19 on the Airport Business (dated 5 May 2020)

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 over 50% of passenger traffic and 57% or over USD97 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 3 scenarios: Baseline, V-shaped and U-shaped

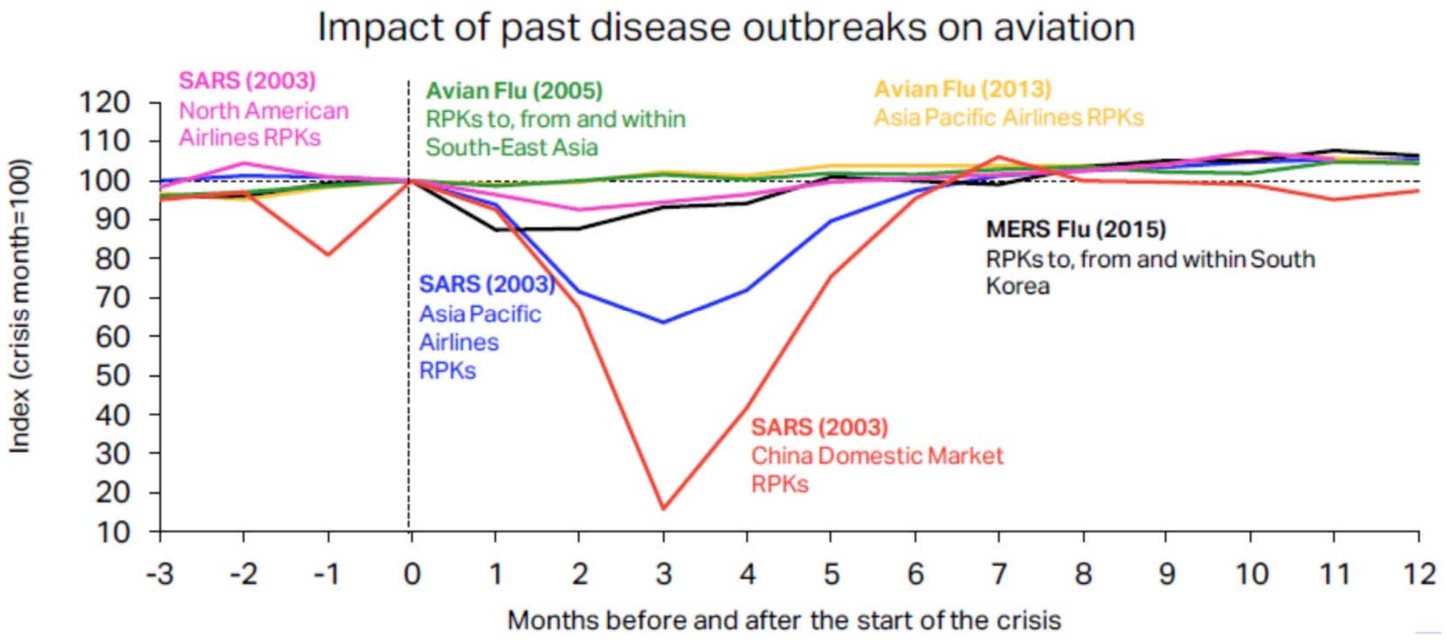
- 3 scenarios to assess the possible economic impact of COVID-19:
  - **Baseline**: counterfactual scenario, in which the COVID-19 pandemic does not occur, that is, **originally-planned** or **business as usual**
  - **Scenario 1**: **V-shaped** path, normal shape for recession, a brief period of contraction 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*

*: Preliminary scenario analysis for scheduled domestic passenger traffic is presented in **Appendix C**.

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 air transport in Asia/Pacific



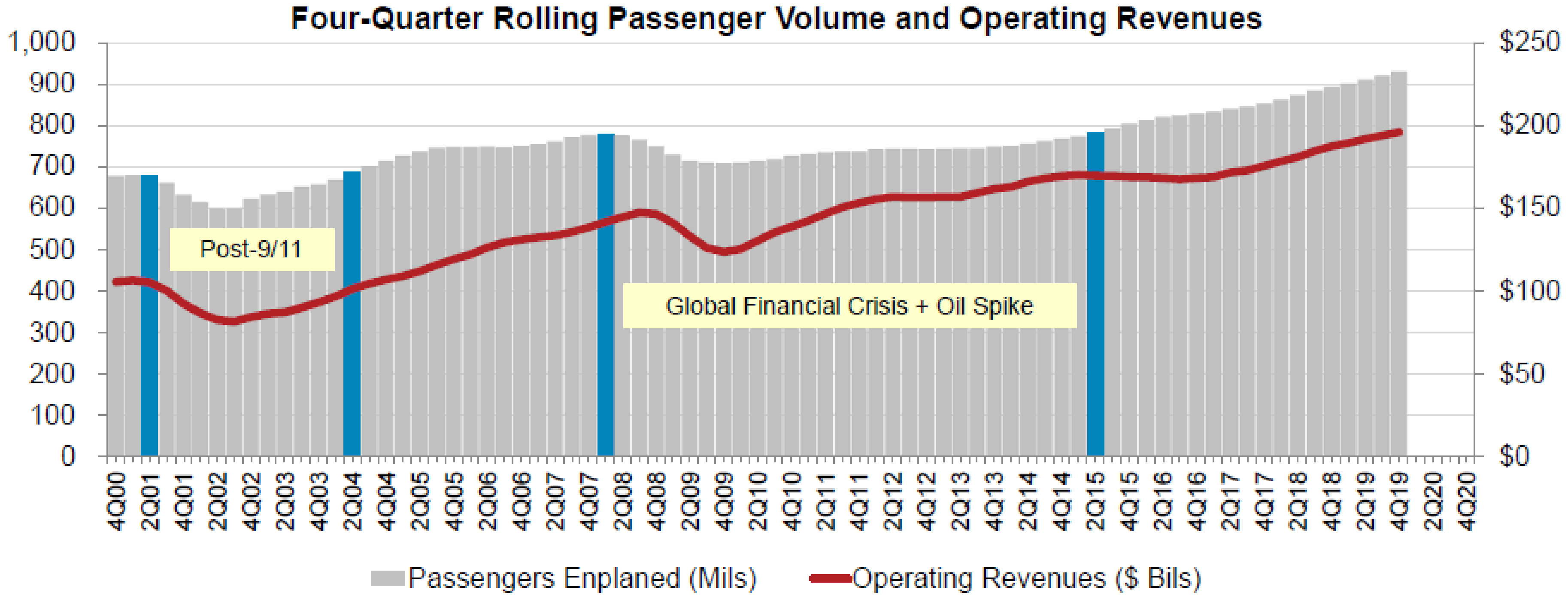
Source: IATA Economics using data from IATA Statistics

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.**

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

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

9/11 and global financial crisis had a U/L-shaped impact on air transport in United States



* Passengers enplaned systemwide on U.S. airlines in scheduled and nonscheduled services
Source: A4A Passenger Airline Cost Index and Bureau of Transportation Statistics (Form 41 Schedule T1)

https://www.airlines.org/dataset/impact-of-covid19-data-updates/

Source: A4A Tracking the Impacts of COVID-19 - Some Early Indicators (updated on 29 April 2020)

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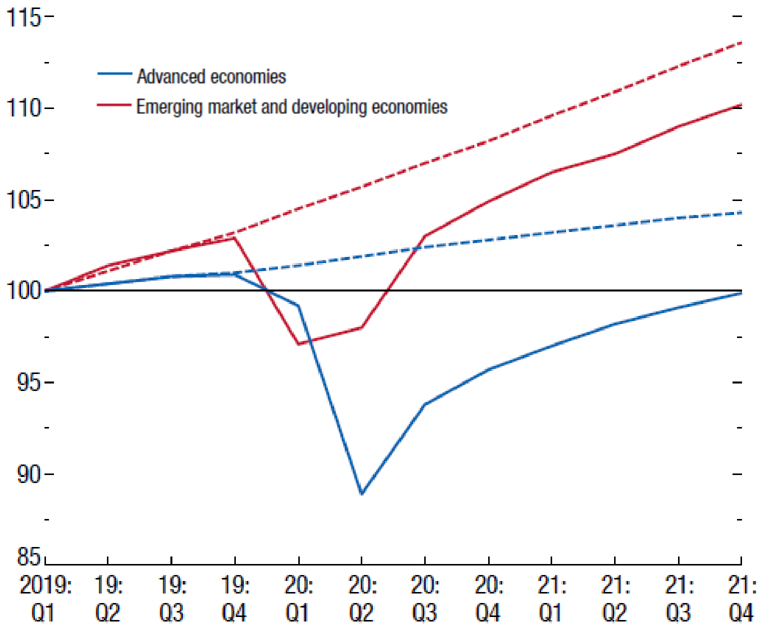
What "recession shape" can be assumed given uncertainties surrounding the outlook?

World's GDP Projections (by IMF)



(2019:Q1 = 100; dashed lines indicate estimates from January 2020 World Economic Outlook Update)

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

- 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?
- Will there be a structural shift in industry and consumers' behaviors?
- How long can the air transport industry withstand the finical adversity?

Source: IMF Word Economic Outlook (April 2020)

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**: Gradual capacity recovery to 80% of Baseline level by December but weak demand return
  - **Path 1a**: Swift capacity rebound to 90% pushed by pent-up demand
  - **Path 1b**: Slow progression to recover 60% capacity with downside risk in demand
- **Scenario 2 (U-shaped path, restart/recovery in 3/4Q or even later)**
  - **Path 2**: Slow progression of capacity recovery to 50% of Baseline with sluggish demand growth
  - **Path 2a**: Swift capacity rebound to 90% by December, outpacing demand recovery
  - **Path 2b**: Prolonged downturn towards 2021 with marginal seasonal adjustments

Assumptions underlying Baseline Scenario (originally-planned, business as usual)

Assumptions (Global)	**Baseline (Originally-planned, business as usual)**	
	Seat capacity	Passenger load factor
January 2020	Airlines' winter schedules filed with OAG as of 6 January 2020	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
February 2020		
March 2020		
April 2020	Maximum number of seats taken from airlines' summer schedules filed with OAG during the period from 6 January 2020 to 20 April 2020	
May 2020		
June 2020		
July 2020		
August 2020		
September 2020		
October 2020	Using 2019 winter schedule as the base, and applying the growth rate of 2019/2018	
November 2020		
December 2020		

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

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 underlying Scenario 1 (V-shaped)

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

Assumptions underlying Scenario 2 (U-shaped)

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 analysis of airlines (RCA); and ICAO-ICM Marketing Information Data Transfer (MIDT passenger origin-destination)
- **Macroeconomic factors:** Income elasticity of demand estimated for ICAO LTF; and IMF economic outlook data

Scenario Analysis

Figures and estimates herein are <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 **3.2%** for 2020, compared to 2019.
- According to the latest estimates, passenger seat capacity could instead drop from the above Baseline by **38% to 55%** (Scenario 1) and **48% to 71%** (Scenario 2).
- This capacity level would be **36% to 54%** (Scenario 1) and **46% to 70%** (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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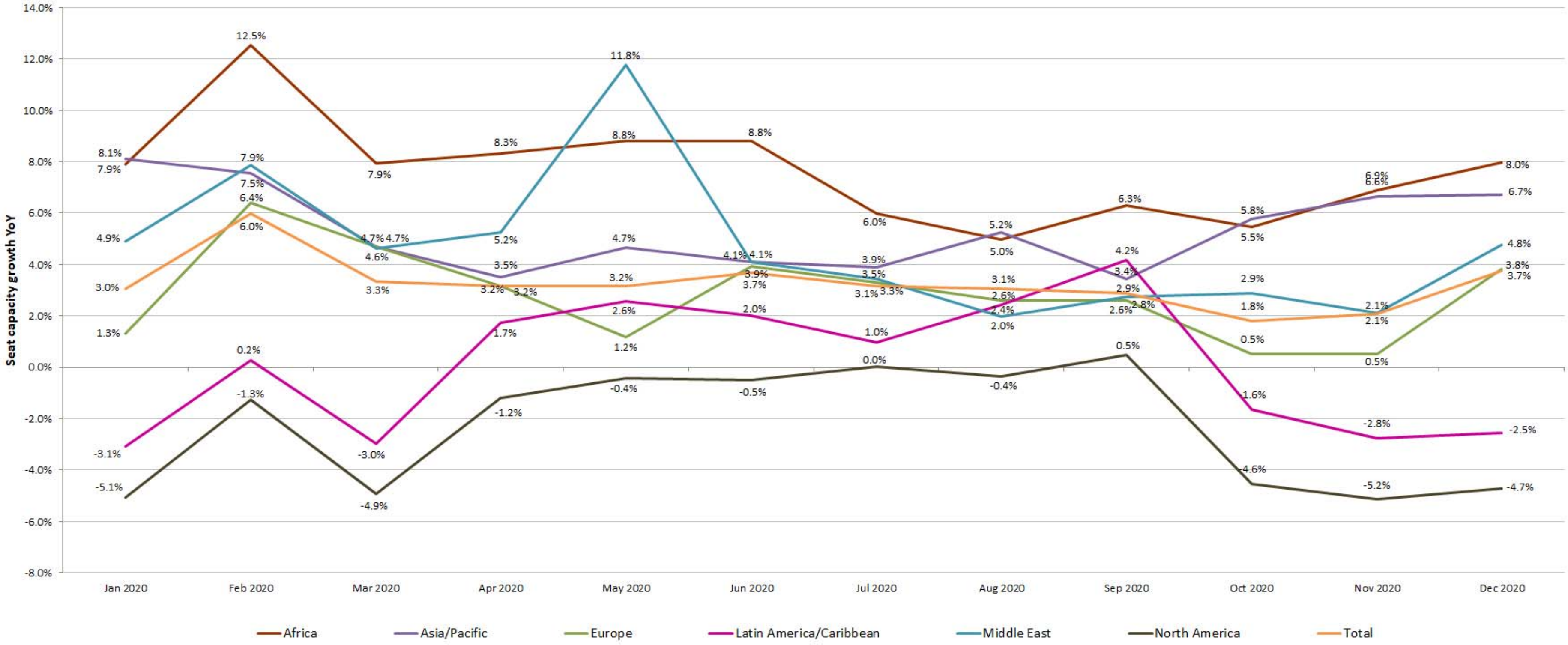
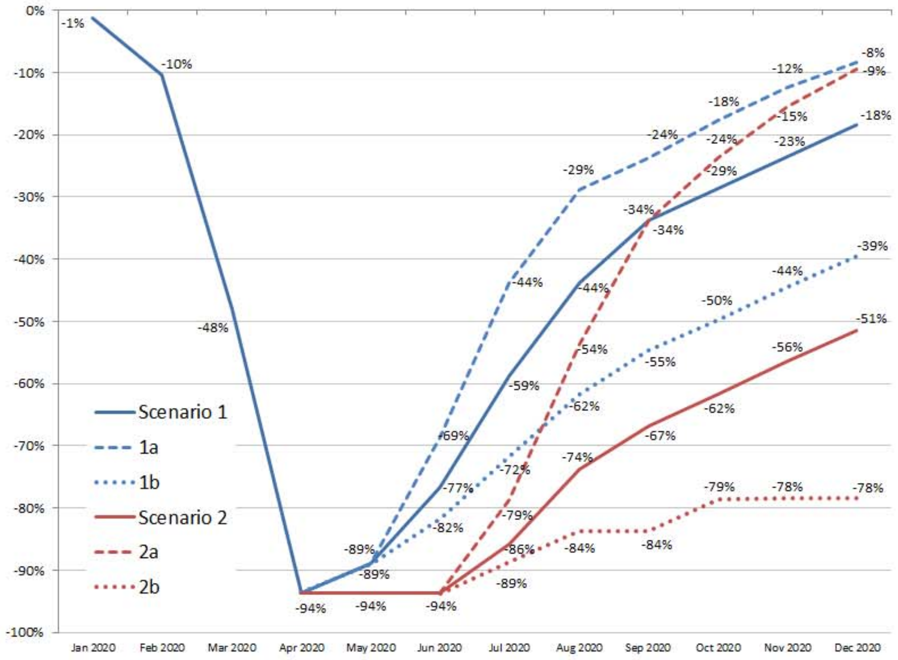
Baseline:
3.2% seat capacity increase from 2019

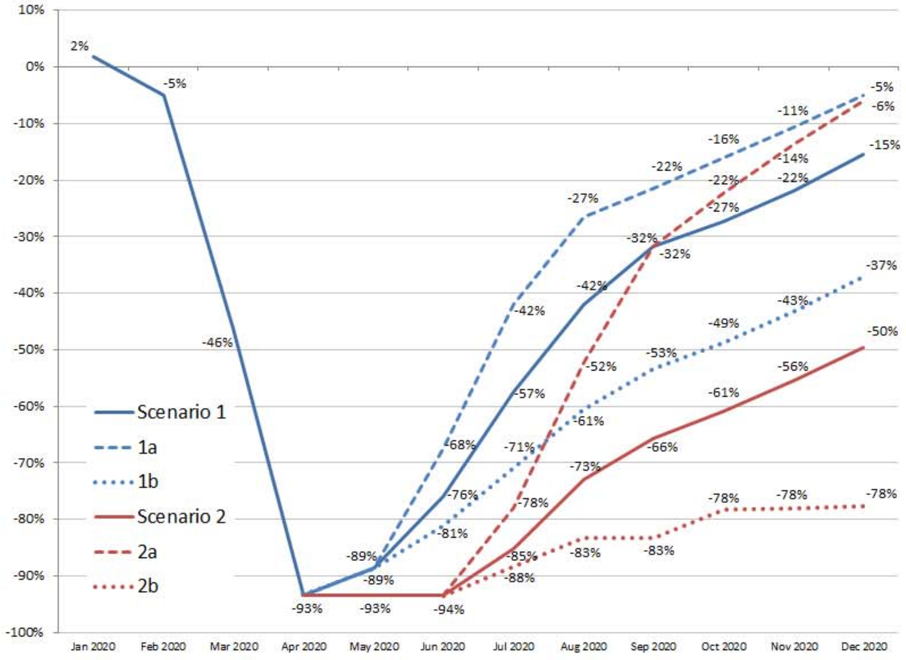


Scenarios 1 & 2: seat capacity reduction by 38 - 71% from Baseline and 36 - 70% from 2019

Comparison to Baseline



Comparison to 2019 (YoY)



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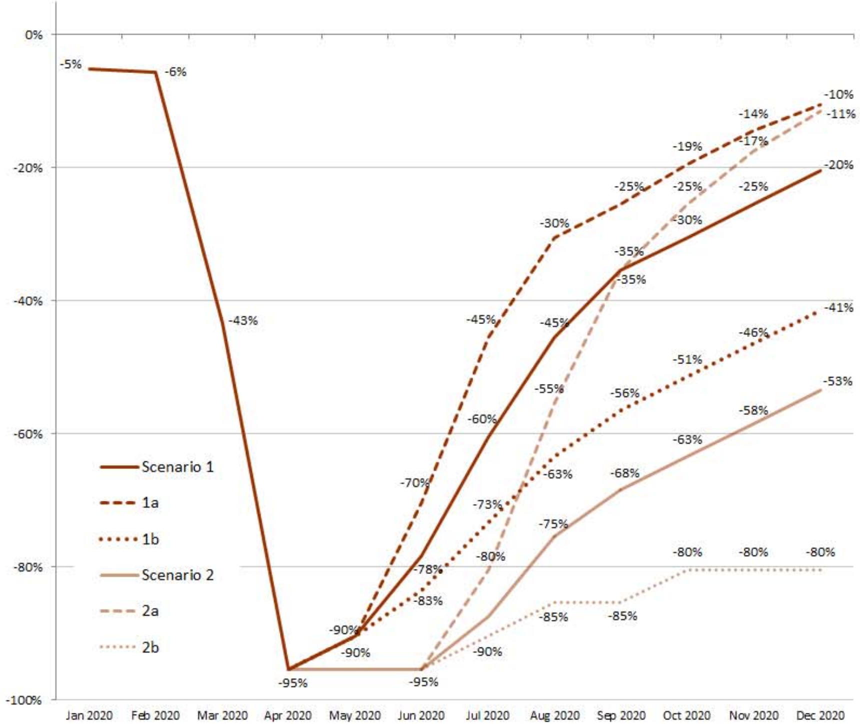
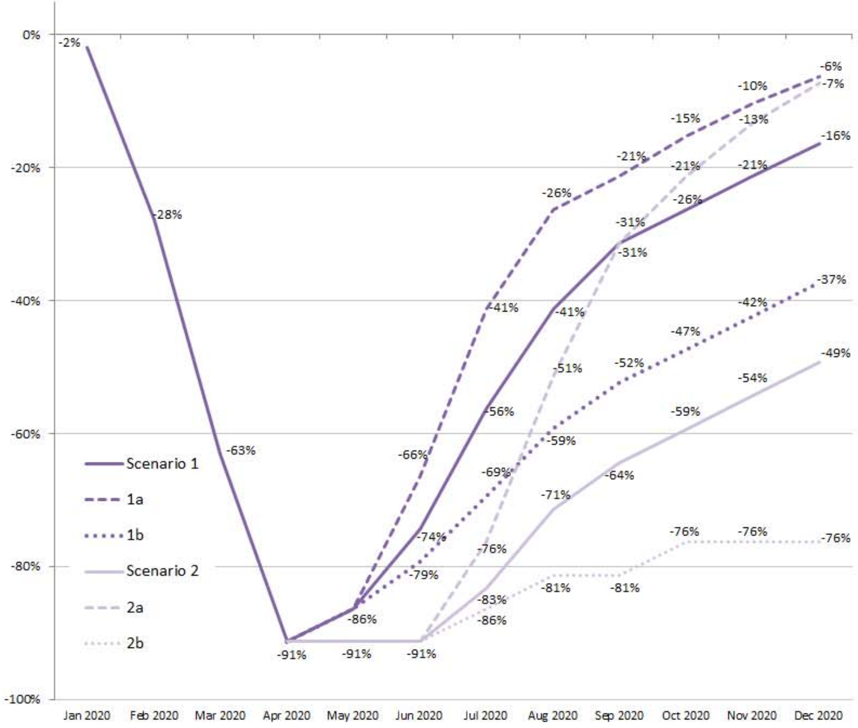
Break-down of seat capacity reduction from Baseline by region (1)

Africa

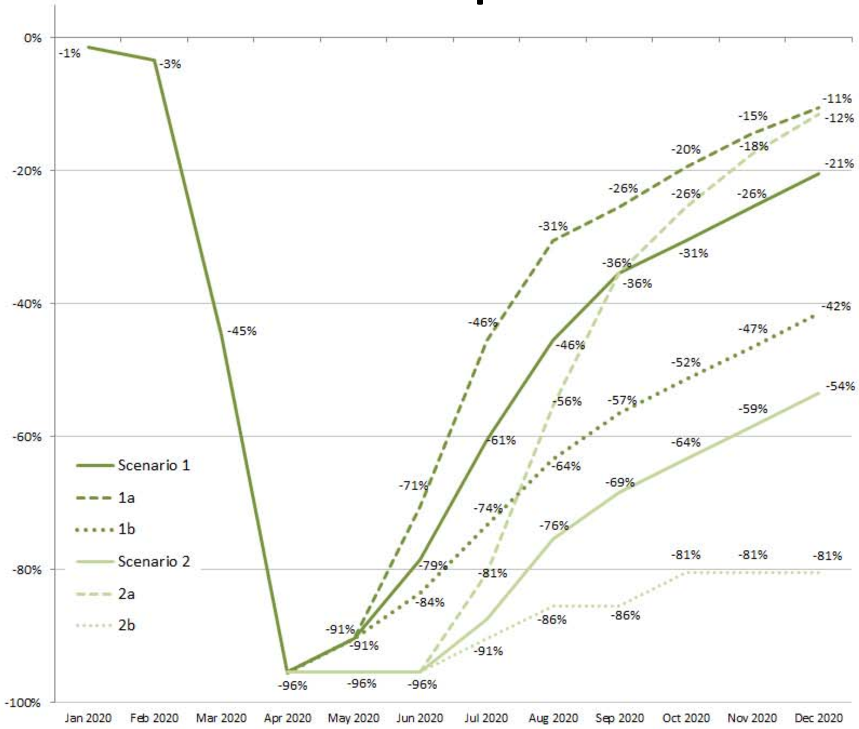


Asia/Pacific

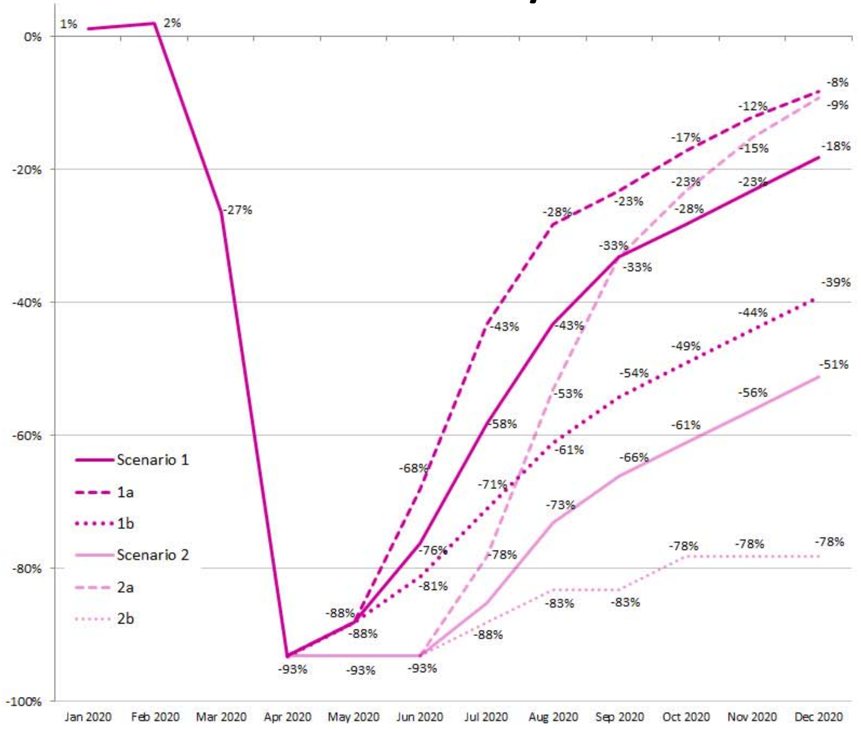


Break-down of seat capacity reduction from Baseline by region (2)

Europe

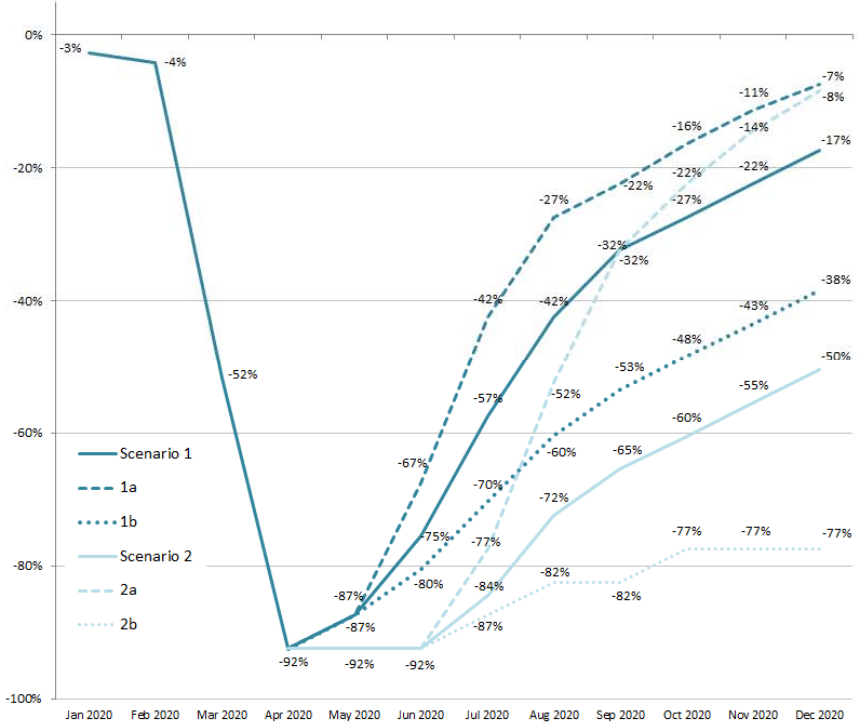


Latin America/Caribbean

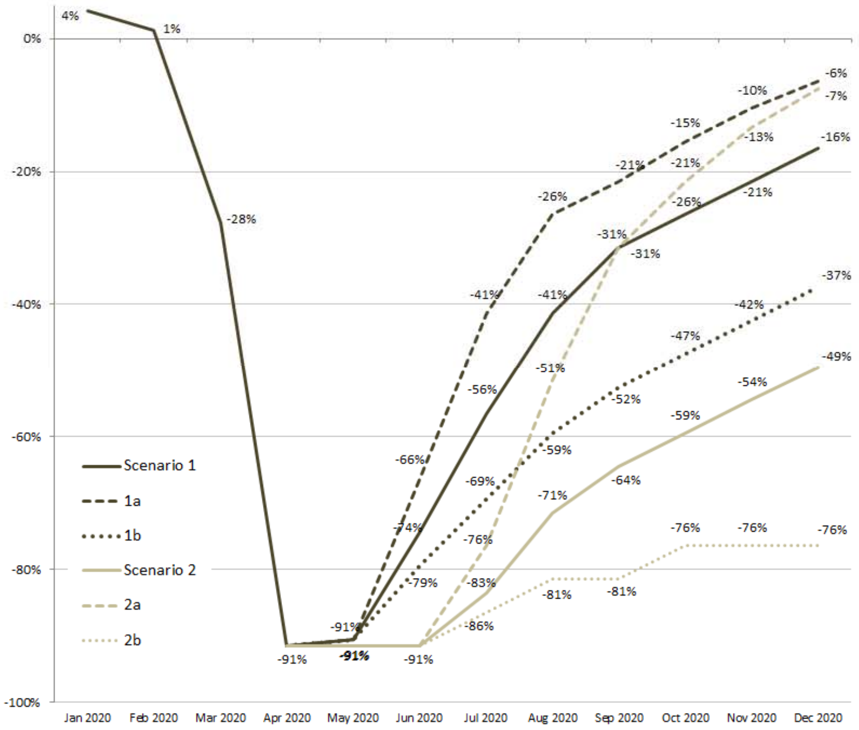


Break-down of seat capacity reduction from Baseline by region (3)

Middle East



North America



Impact on International Passenger Numbers (Demand)

- Given the originally-planned seat capacity, passenger demand could have increased **72 million** for 2020, compared to 2019.
- According to the latest estimates, passenger demand could instead drop from the above Baseline by **861 to 1,292 million** (Scenario 1) and **1,108 to 1,524 million** (Scenario 2).
- This demand level would be **789 to 1,221 million** (Scenario 1) and **1,036 to 1,452 million** (Scenario 2) below the 2019 level.
- The most substantial demand reduction (in number) is expected to be in Europe, hitting summer travel peak season, followed by Asia/Pacific.

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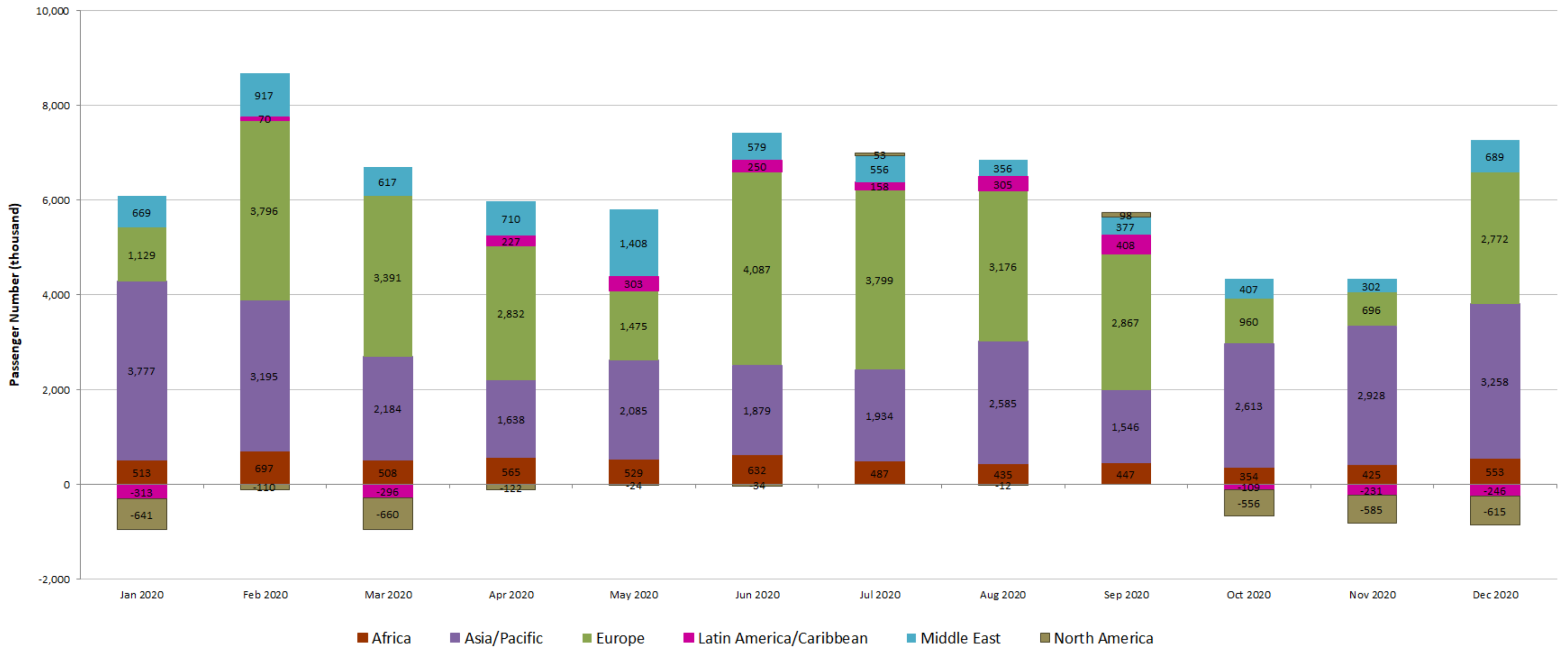
Baseline:
72 million increase of passengers from 2019



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: 861 - 1,524 million less passengers than Baseline and 789 - 1,452 million below 2019

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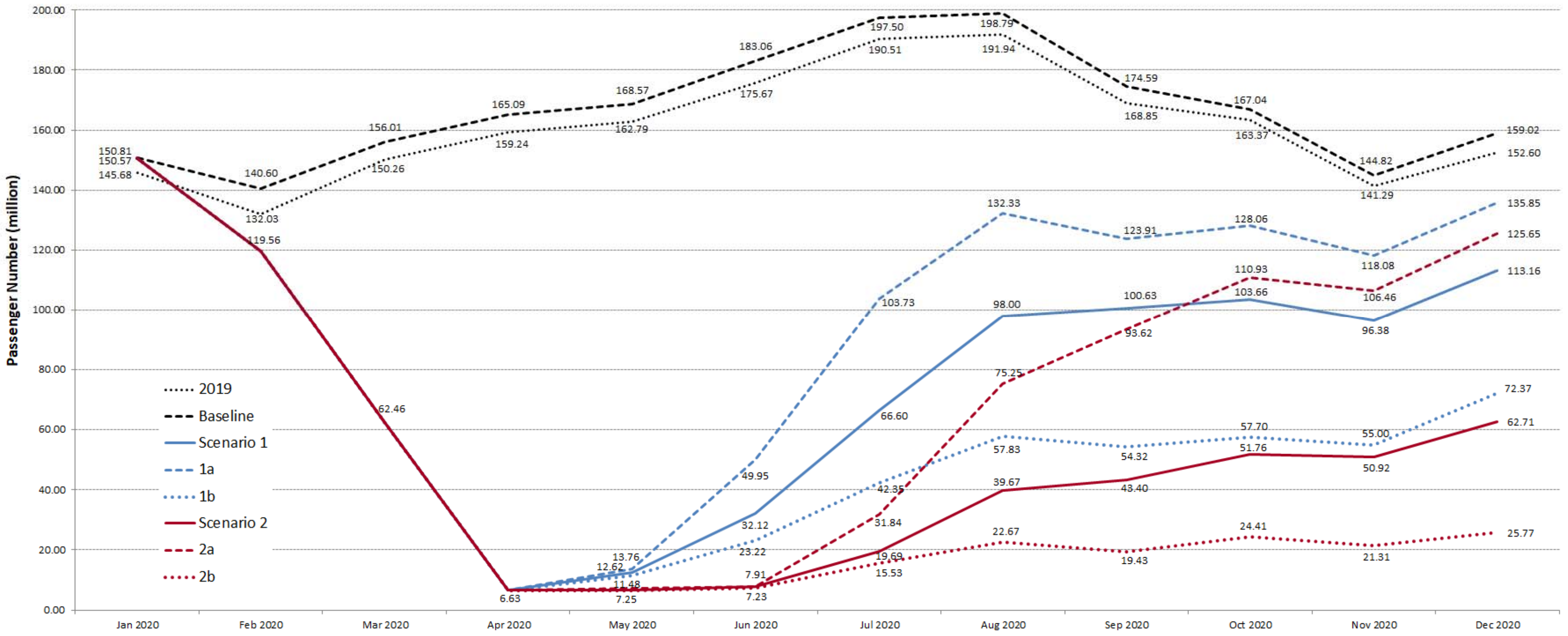
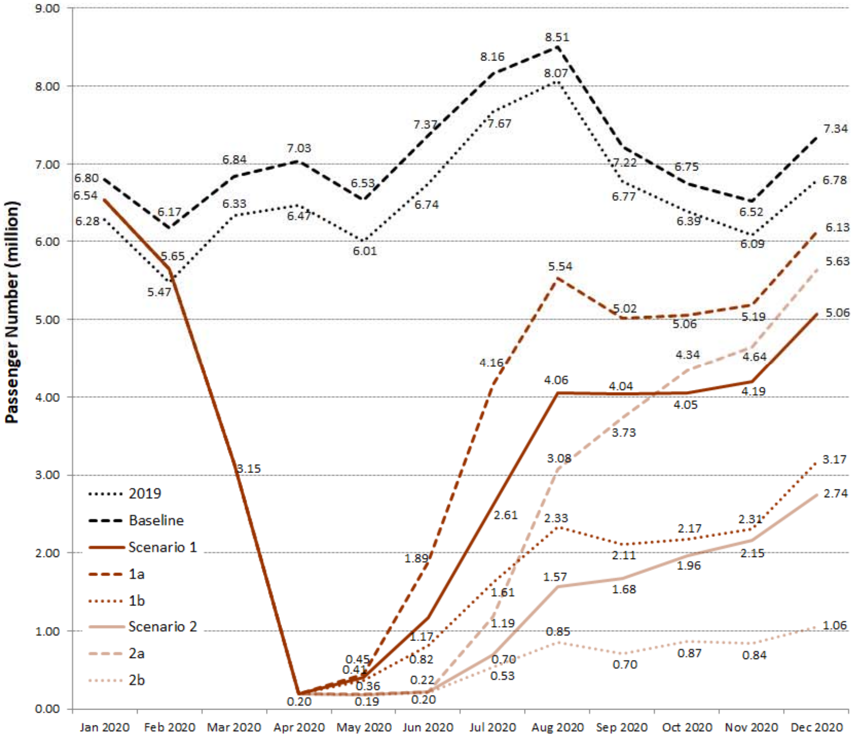


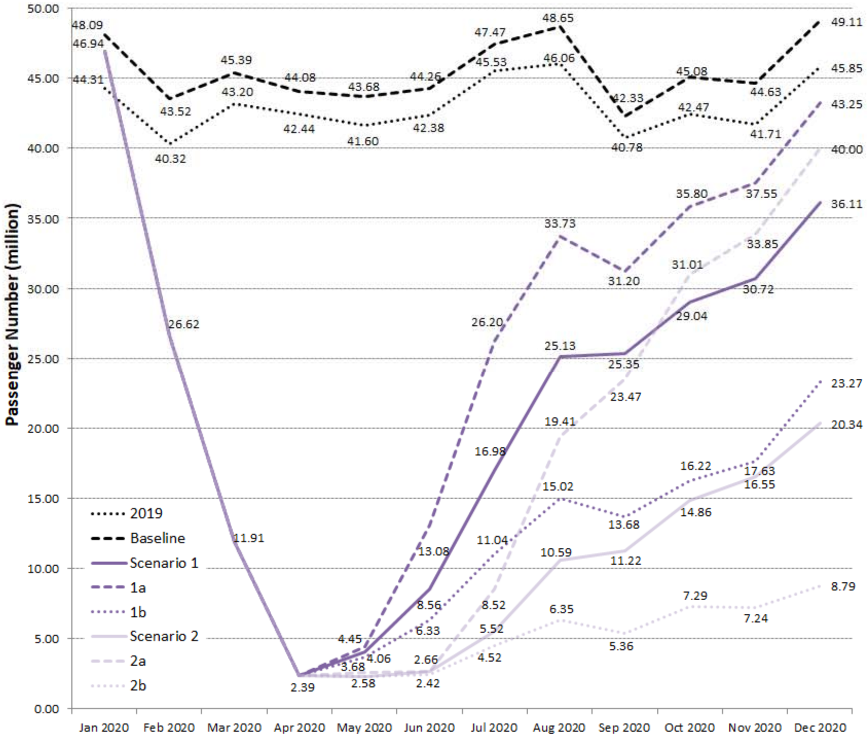
Note: Number of international passengers departing <u>from</u> each country and territory, which are aggregated at the regional level to avoid double counting

Break-down of passenger number by region (1)

Africa

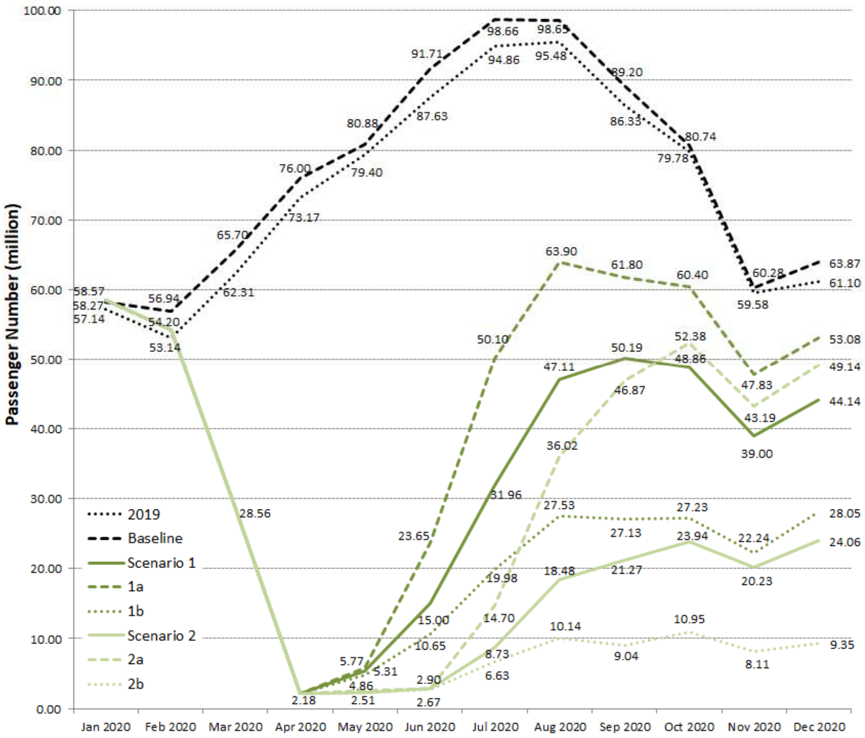


Asia/Pacific

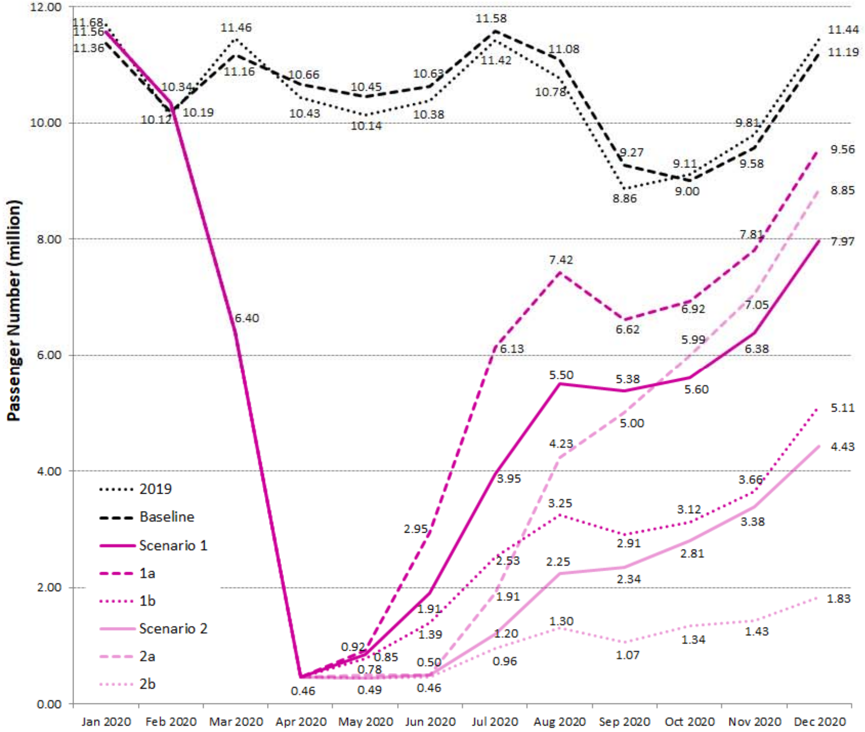


Break-down of passenger number by region (2)

Europe

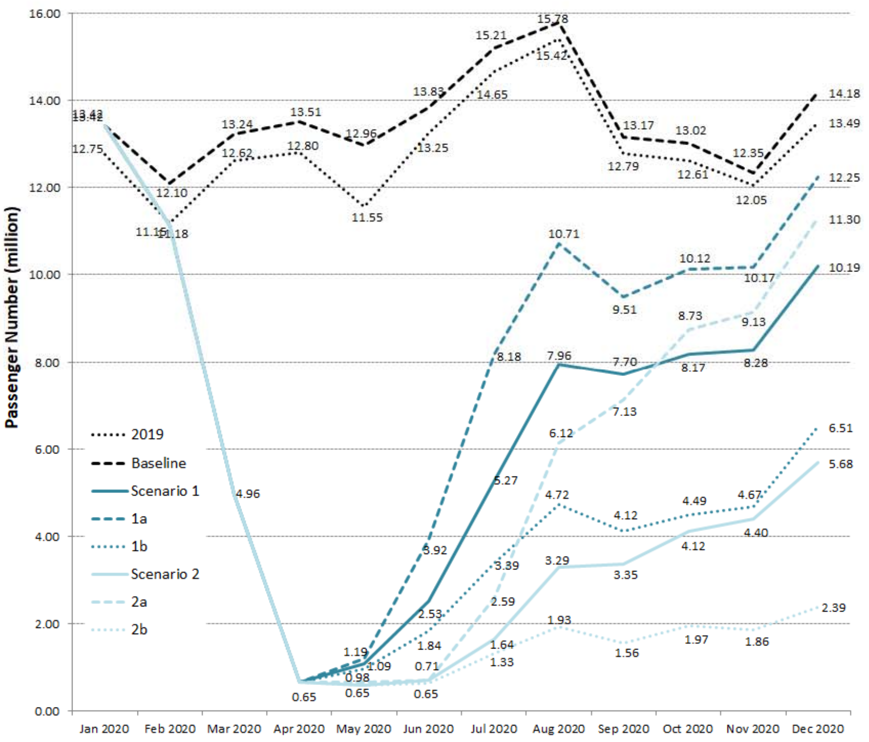


Latin America/Caribbean

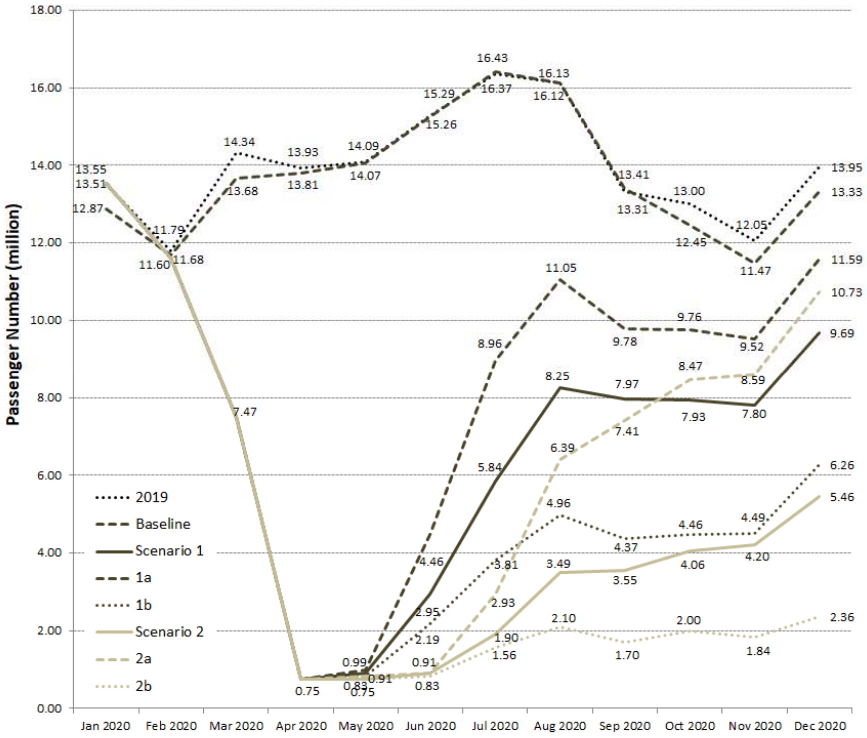


Break-down of passenger number by region (3)

Middle East



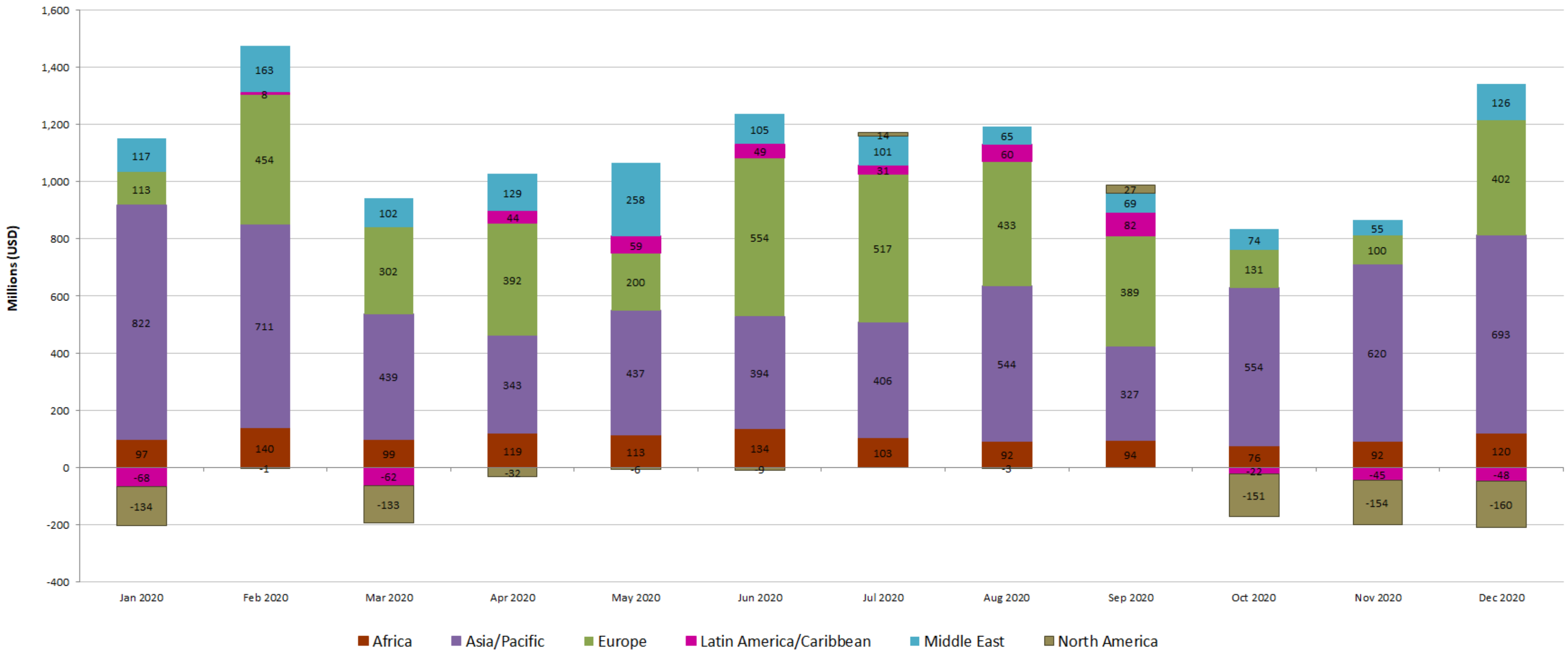
North America



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 151 to 228 billion** (Scenario 1) and **USD 194 to 269 billion** (Scenario 2) below the above Baseline, or **USD 139 to 216 billion** (Scenario 1) and **USD 183 to 257 billion** (Scenario 2) below the 2019 level.
- Over two-third of revenue loss would be recorded by Europe and Asia/Pacific.

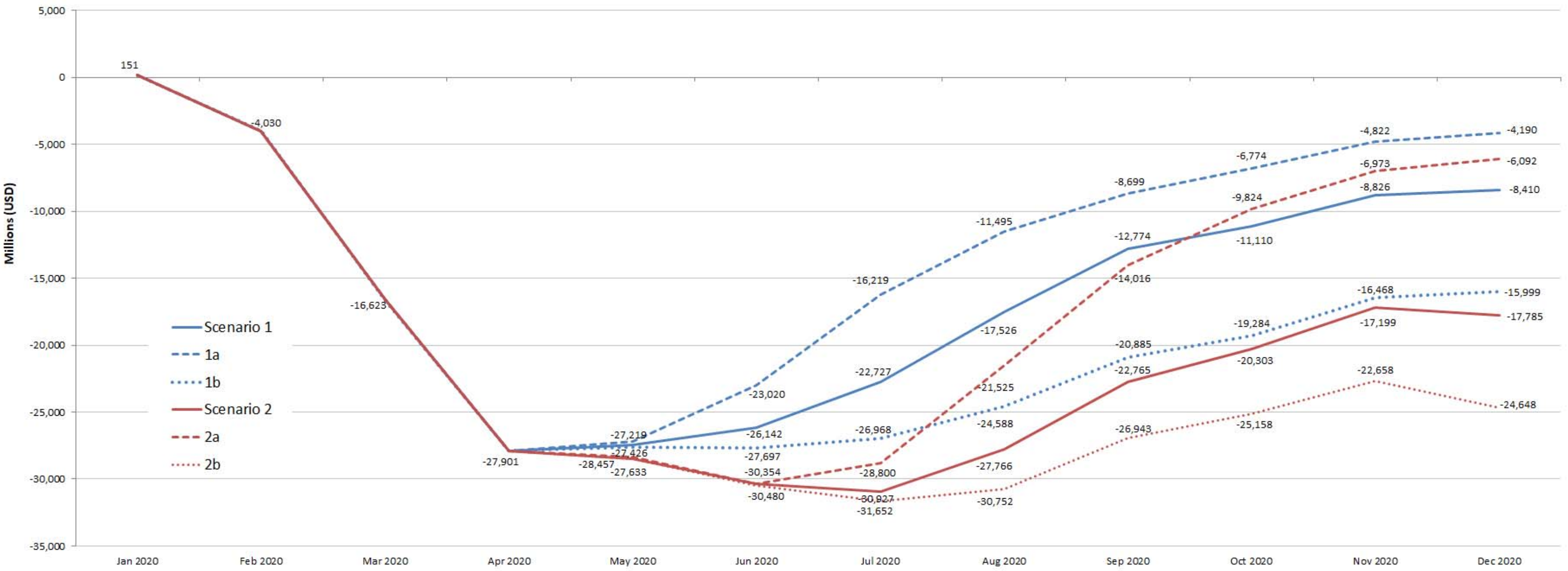
Baseline: USD 12 billion increase of revenues from 2019



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).

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

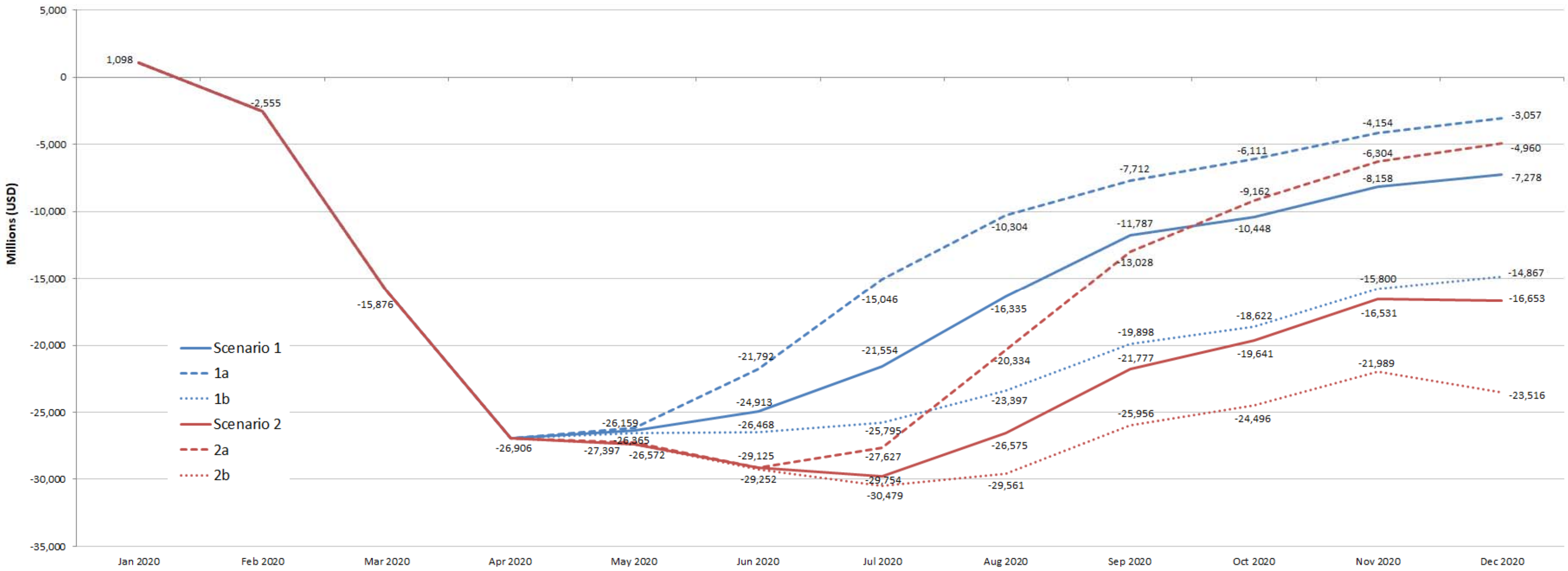
Scenarios 1 & 2: USD 151 to 269 billion less revenues than Baseline



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).

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

Scenarios 1 & 2:
USD 139 to 257 billion less revenues than 2019

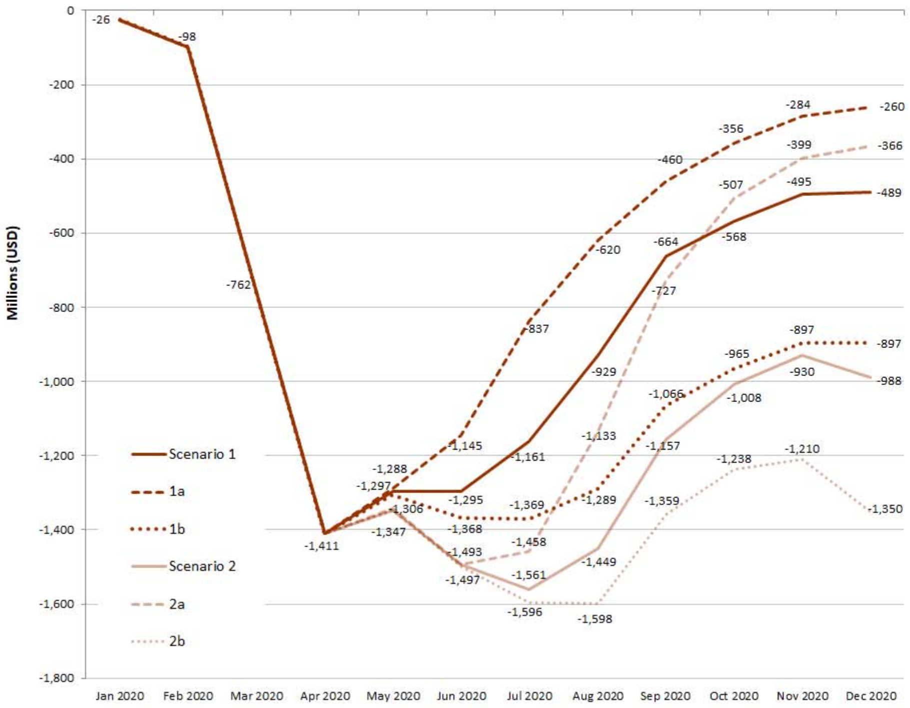


Note: The above revenues are gross passenger operating revenues of all airlines serving international routes from each country and territory, which are aggregated at the regional level (revenues of international routes to each country and territory were removed to avoid double counting).

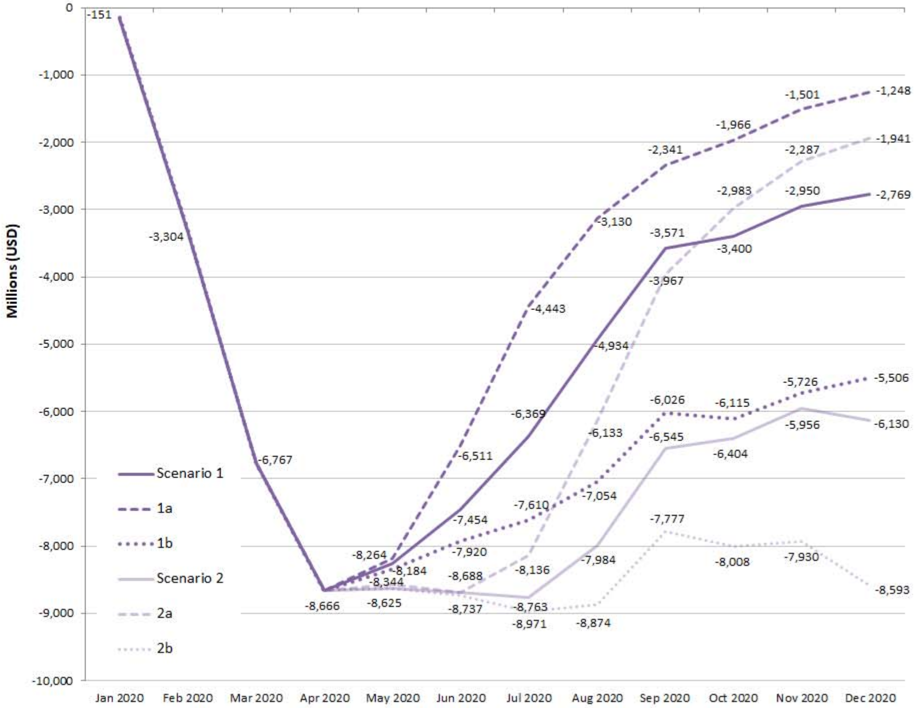
Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO RCA, IATA Economics, and IMF Economic Outlook

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

Africa



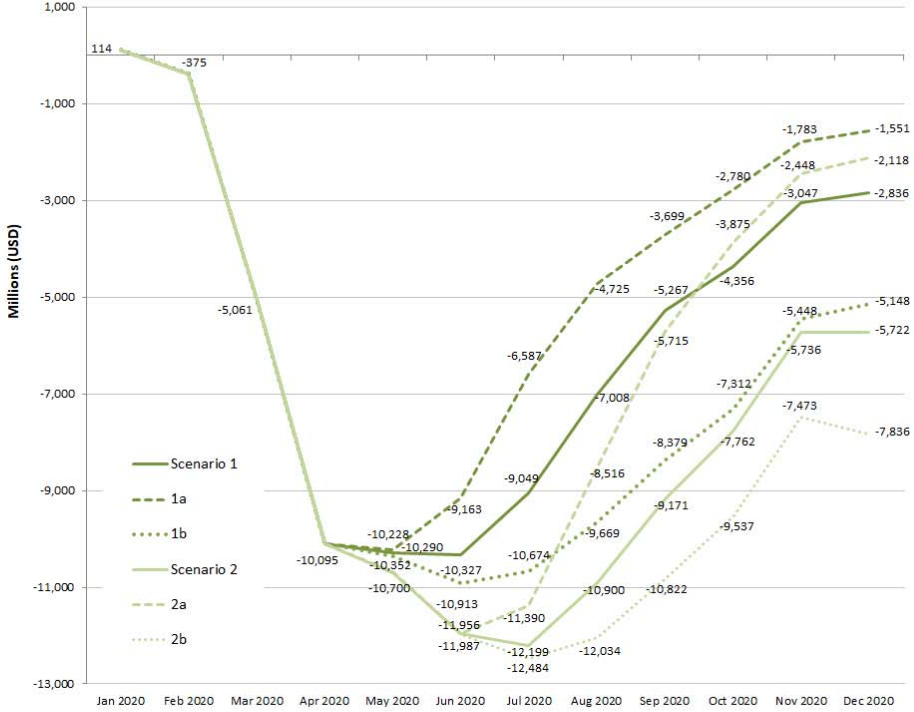
Asia/Pacific



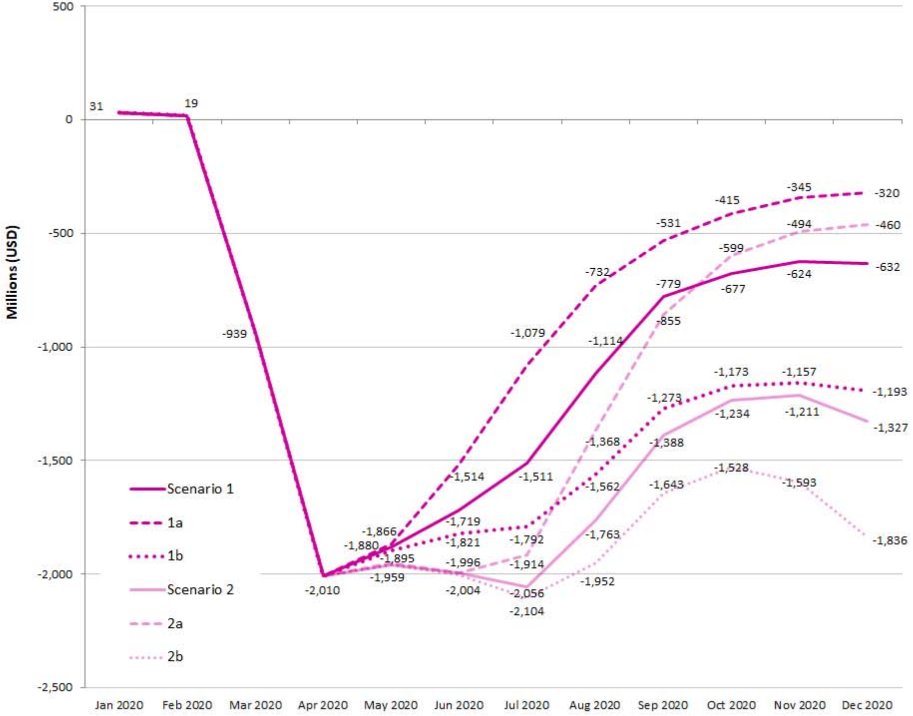
Source: ICAO estimates based on ICAO ADS-B, OAG, ICAO-ICM MIDT, ICAO LTF, ICAO RCA, IATA Economics, and IMF Economic Outlook

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

Europe



Latin America/Caribbean



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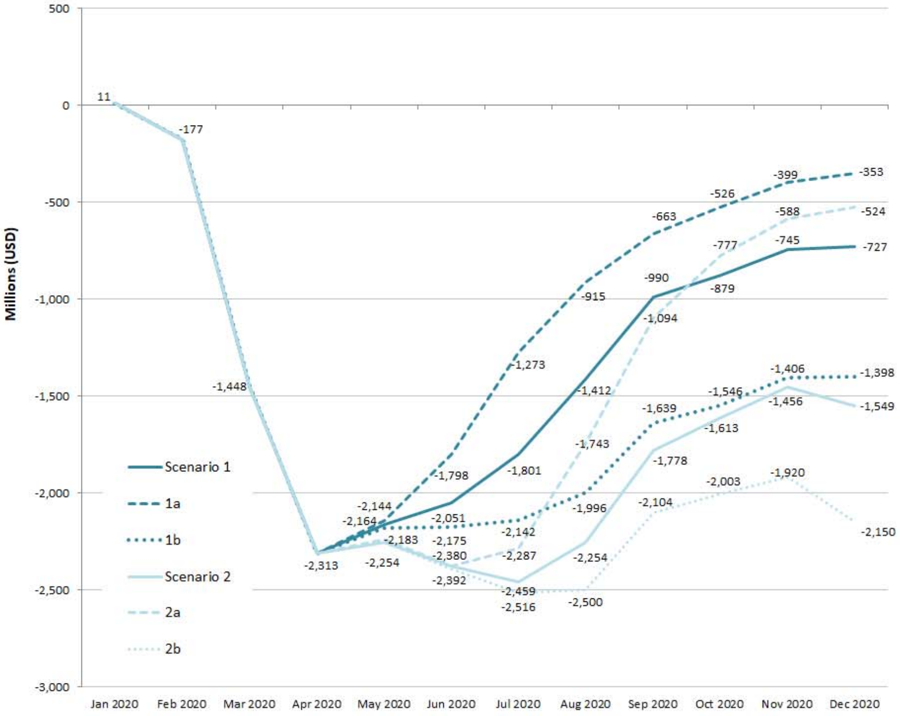
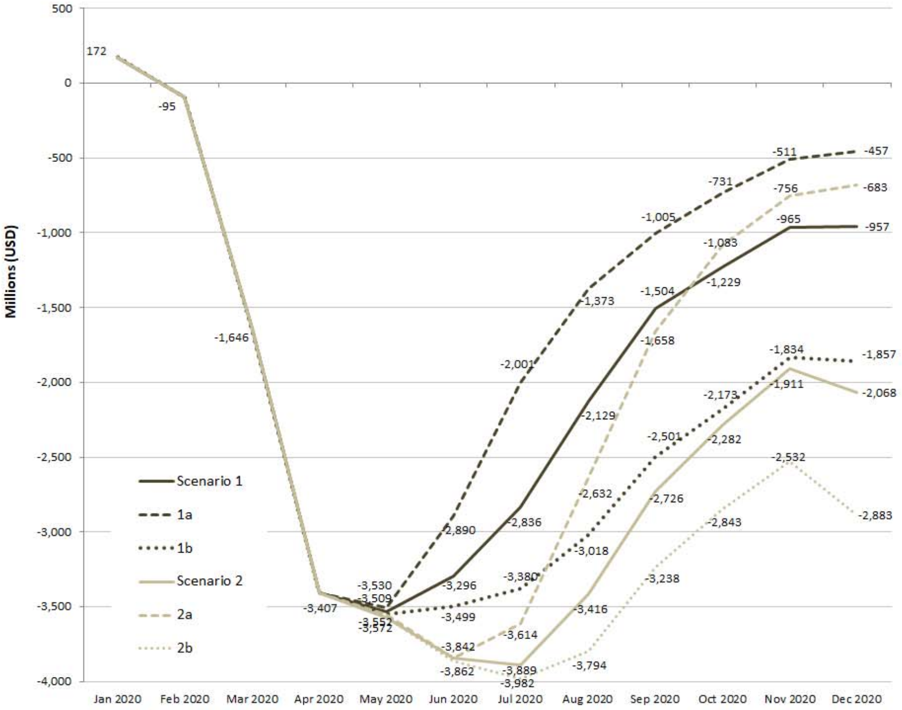
Break-down of revenue reduction compared to Baseline by region (3)

Middle East



North America



Summary of Key Impact Indicators

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

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%	5.13	0.95
February 2020	6.0%	8.56	1.47
March 2020	3.3%	5.74	0.75
April 2020	3.2%	5.85	1.00
May 2020	3.2%	5.78	1.06
June 2020	3.7%	7.39	1.23
July 2020	3.1%	6.99	1.17
August 2020	3.1%	6.84	1.19
September 2020	2.9%	5.74	0.99
October 2020	1.8%	3.67	0.66
November 2020	2.1%	3.53	0.67
December 2020	3.7%	6.41	1.13
Total	**3.2%**	**71.65**	**12.27**

Compared to 2019 (year-on-year)	Baseline (Originally-planned or business as usual)		
Region	Seat Capacity (%)	Passenger number (million)	Passenger revenue (USD, billion)
Africa	7.5%	6.14	1.28
Asia/Pacific	5.4%	29.62	6.29
Europe	2.8%	30.98	3.99
Latin America/Caribbean	0.0%	0.53	0.09
Middle East	4.6%	7.59	1.36
North America	-2.2%	-3.21	-0.74
Total	**3.2%**	**71.65**	**12.27**

Source: ICAO estimates

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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%	-0.24	0.15	-1.2%	-0.24	0.15	-1.2%	-0.24	0.15
February 2020	-10.3%	-21.04	-4.03	-10.3%	-21.04	-4.03	-10.3%	-21.04	-4.03
March 2020	-48.0%	-93.55	-16.62	-48.0%	-93.55	-16.62	-48.0%	-93.55	-16.62
April 2020	-93.6%	-158.46	-27.90	-93.6%	-158.46	-27.90	-93.6%	-158.46	-27.90
May 2020	-89.0%	-155.95	-27.43	-89.0%	-154.81	-27.22	-89.0%	-157.09	-27.63
June 2020	-76.7%	-150.95	-26.14	-68.7%	-133.11	-23.02	-81.7%	-159.84	-27.70
July 2020	-58.7%	-130.90	-22.73	-43.7%	-93.77	-16.22	-71.7%	-155.15	-26.97
August 2020	-43.7%	-100.79	-17.53	-28.7%	-66.46	-11.50	-61.7%	-140.96	-24.59
September 2020	-33.8%	-73.96	-12.77	-23.8%	-50.68	-8.70	-54.8%	-120.27	-20.89
October 2020	-28.7%	-63.38	-11.11	-17.7%	-38.98	-6.77	-49.7%	-109.34	-19.28
November 2020	-23.4%	-48.44	-8.83	-12.4%	-26.74	-4.82	-44.4%	-89.82	-16.47
December 2020	-18.4%	-45.85	-8.41	-8.4%	-23.17	-4.19	-39.4%	-86.64	-16.00
Total	**-45.0%**	**-1,043.50**	**-183.34**	**-38.1%**	**-861.00**	**-150.84**	**-55.3%**	**-1,292.40**	**-227.93**

Source: ICAO estimates

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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%	4.89	1.10	1.8%	4.89	1.10	1.8%	4.89	1.10
February 2020	-5.0%	-12.48	-2.56	-5.0%	-12.48	-2.56	-5.0%	-12.48	-2.56
March 2020	-46.2%	-87.81	-15.87	-46.2%	-87.81	-15.87	-46.2%	-87.81	-15.87
April 2020	-93.4%	-152.61	-26.90	-93.4%	-152.61	-26.90	-93.4%	-152.61	-26.90
May 2020	-88.7%	-150.17	-26.37	-88.7%	-149.03	-26.16	-88.7%	-151.31	-26.57
June 2020	-75.9%	-143.56	-24.91	-67.6%	-125.72	-21.79	-81.1%	-152.45	-26.47
July 2020	-57.4%	-123.91	-21.56	-42.0%	-86.78	-15.05	-70.9%	-148.16	-25.80
August 2020	-42.0%	-93.95	-16.34	-26.6%	-59.62	-10.31	-60.6%	-134.12	-23.40
September 2020	-31.8%	-68.22	-11.78	-21.5%	-44.94	-7.71	-53.4%	-114.53	-19.90
October 2020	-27.4%	-59.71	-10.45	-16.2%	-35.31	-6.11	-48.8%	-105.67	-18.62
November 2020	-21.9%	-44.91	-8.16	-10.6%	-23.21	-4.15	-43.3%	-86.29	-15.80
December 2020	-15.4%	-39.44	-7.28	-5.0%	-16.76	-3.06	-37.2%	-80.23	-14.87
Total	**-43.3%**	**-971.85**	**-171.07**	**-36.1%**	**-789.35**	**-138.57**	**-53.8%**	**-1,220.75**	**-215.66**

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	-45.1%	-44.11	-9.20	-38.2%	-36.27	-7.55	-55.3%	-54.81	-11.45
Asia/Pacific	-44.4%	-282.46	-58.60	-37.6%	-233.16	-48.21	-54.5%	-351.54	-73.19
Europe	-47.3%	-495.84	-67.60	-40.1%	-410.88	-55.93	-57.7%	-609.73	-83.31
Latin America/Caribbean	-40.3%	-59.83	-11.83	-33.7%	-49.05	-9.70	-50.0%	-74.62	-14.76
Middle East	-43.0%	-81.40	-14.69	-36.2%	-66.54	-12.00	-53.1%	-101.86	-18.41
North America	-40.9%	-79.87	-21.42	-34.1%	-65.09	-17.45	-50.8%	-99.83	-26.79
Total	**-45.0%**	**-1,043.50**	**-183.34**	**-38.1%**	**-861.00**	**-150.84**	**-55.3%**	**-1,292.40**	**-227.93**

Source: ICAO estimates

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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	-41.0%	-37.97	-7.92	-33.5%	-30.13	-6.27	-52.0%	-48.67	-10.17
Asia/Pacific	-41.4%	-252.84	-52.31	-34.3%	-203.54	-41.92	-52.0%	-321.92	-66.90
Europe	-45.8%	-464.86	-63.61	-38.4%	-379.90	-51.94	-56.6%	-578.75	-79.32
Latin America/Caribbean	-40.3%	-59.30	-11.74	-33.8%	-48.52	-9.61	-50.0%	-74.09	-14.67
Middle East	-40.4%	-73.81	-13.33	-33.2%	-58.95	-10.64	-51.0%	-94.27	-17.05
North America	-42.2%	-83.08	-22.16	-35.6%	-68.30	-18.19	-51.9%	-103.04	-27.53
Total	**-43.3%**	**-971.85**	**-171.07**	**-36.1%**	**-789.35**	**-138.57**	**-53.8%**	**-1,220.75**	**-215.66**

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%	-0.24	0.15	-1.2%	-0.24	0.15	-1.2%	-0.24	0.15
February 2020	-10.3%	-21.04	-4.03	-10.3%	-21.04	-4.03	-10.3%	-21.04	-4.03
March 2020	-48.0%	-93.55	-16.62	-48.0%	-93.55	-16.62	-48.0%	-93.55	-16.62
April 2020	-93.6%	-158.46	-27.90	-93.6%	-158.46	-27.90	-93.6%	-158.46	-27.90
May 2020	-93.7%	-161.98	-28.46	-93.7%	-161.32	-28.33	-93.7%	-161.98	-28.46
June 2020	-93.7%	-175.16	-30.35	-93.7%	-175.16	-30.35	-93.7%	-175.84	-30.48
July 2020	-85.7%	-177.81	-30.93	-78.7%	-165.66	-28.80	-88.7%	-181.97	-31.65
August 2020	-73.7%	-159.12	-27.77	-53.7%	-123.53	-21.52	-83.7%	-176.12	-30.75
September 2020	-66.8%	-131.19	-22.77	-33.8%	-80.97	-14.02	-83.8%	-155.16	-26.94
October 2020	-61.7%	-115.28	-20.30	-23.7%	-56.11	-9.82	-78.7%	-142.63	-25.16
November 2020	-56.4%	-93.90	-17.20	-15.4%	-38.36	-6.97	-78.4%	-123.51	-22.66
December 2020	-51.4%	-96.31	-17.79	-9.4%	-33.37	-6.09	-78.4%	-133.25	-24.65
Total	**-63.1%**	**-1,384.04**	**-243.96**	**-48.1%**	**-1,107.78**	**-194.32**	**-71.0%**	**-1,523.74**	**-269.15**

Source: ICAO estimates

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%	4.89	1.10	1.8%	4.89	1.10	1.8%	4.89	1.10
February 2020	-5.0%	-12.48	-2.56	-5.0%	-12.48	-2.56	-5.0%	-12.48	-2.56
March 2020	-46.2%	-87.81	-15.87	-46.2%	-87.81	-15.87	-46.2%	-87.81	-15.87
April 2020	-93.4%	-152.61	-26.90	-93.4%	-152.61	-26.90	-93.4%	-152.61	-26.90
May 2020	-93.5%	-156.20	-27.40	-93.5%	-155.54	-27.27	-93.5%	-156.20	-27.40
June 2020	-93.5%	-167.77	-29.12	-93.5%	-167.77	-29.12	-93.5%	-168.45	-29.25
July 2020	-85.3%	-170.82	-29.76	-78.1%	-158.67	-27.63	-88.4%	-174.98	-30.48
August 2020	-72.9%	-152.28	-26.58	-52.3%	-116.69	-20.33	-83.2%	-169.28	-29.56
September 2020	-65.8%	-125.45	-21.78	-31.8%	-75.23	-13.03	-83.3%	-149.42	-25.95
October 2020	-61.0%	-111.61	-19.64	-22.3%	-52.44	-9.16	-78.3%	-138.96	-24.50
November 2020	-55.5%	-90.37	-16.53	-13.7%	-34.83	-6.30	-78.0%	-119.98	-21.99
December 2020	-49.6%	-89.90	-16.66	-6.0%	-26.96	-4.96	-77.6%	-126.84	-23.52
Total	**-61.9%**	**-1,312.39**	**-231.69**	**-46.4%**	**-1,036.13**	**-182.05**	**-70.1%**	**-1,452.09**	**-256.88**

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	-63.1%	-58.50	-12.23	-47.9%	-46.65	-9.72	-71.2%	-64.46	-13.49
Asia/Pacific	-62.1%	-374.36	-77.98	-46.8%	-296.94	-61.60	-70.2%	-414.13	-86.40
Europe	-65.9%	-655.50	-89.56	-50.9%	-529.70	-72.11	-73.7%	-718.22	-98.29
Latin America/Caribbean	-57.4%	-80.01	-15.83	-42.9%	-63.35	-12.54	-65.1%	-88.54	-17.52
Middle East	-60.8%	-108.80	-19.67	-45.7%	-86.21	-15.56	-68.8%	-120.32	-21.76
North America	-58.2%	-106.86	-28.68	-43.7%	-84.93	-22.80	-65.9%	-118.06	-31.68
Total	**-63.1%**	**-1,384.04**	**-243.96**	**-48.1%**	**-1,107.78**	**-194.32**	**-71.0%**	**-1,523.74**	**-269.15**

Source: ICAO estimates

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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	-60.4%	-52.36	-10.95	-44.0%	-40.51	-8.44	-69.0%	-58.32	-12.21
Asia/Pacific	-60.1%	-344.74	-71.69	-44.0%	-267.32	-55.31	-68.6%	-384.51	-80.11
Europe	-64.9%	-624.52	-85.57	-49.5%	-498.72	-68.12	-73.0%	-687.24	-94.30
Latin America/Caribbean	-57.4%	-79.48	-15.74	-43.0%	-62.82	-12.45	-65.1%	-88.01	-17.43
Middle East	-59.0%	-101.21	-18.31	-43.2%	-78.62	-14.20	-67.4%	-112.73	-20.40
North America	-59.1%	-110.07	-29.42	-44.9%	-88.14	-23.54	-66.7%	-121.27	-32.42
Total	**-61.9%**	**-1,312.39**	**-231.69**	**-46.4%**	**-1,036.13**	**-182.05**	**-70.1%**	**-1,452.09**	**-256.88**

Source: ICAO estimates

Appendix A: Situation Overview

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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

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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

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The world reached 3 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*

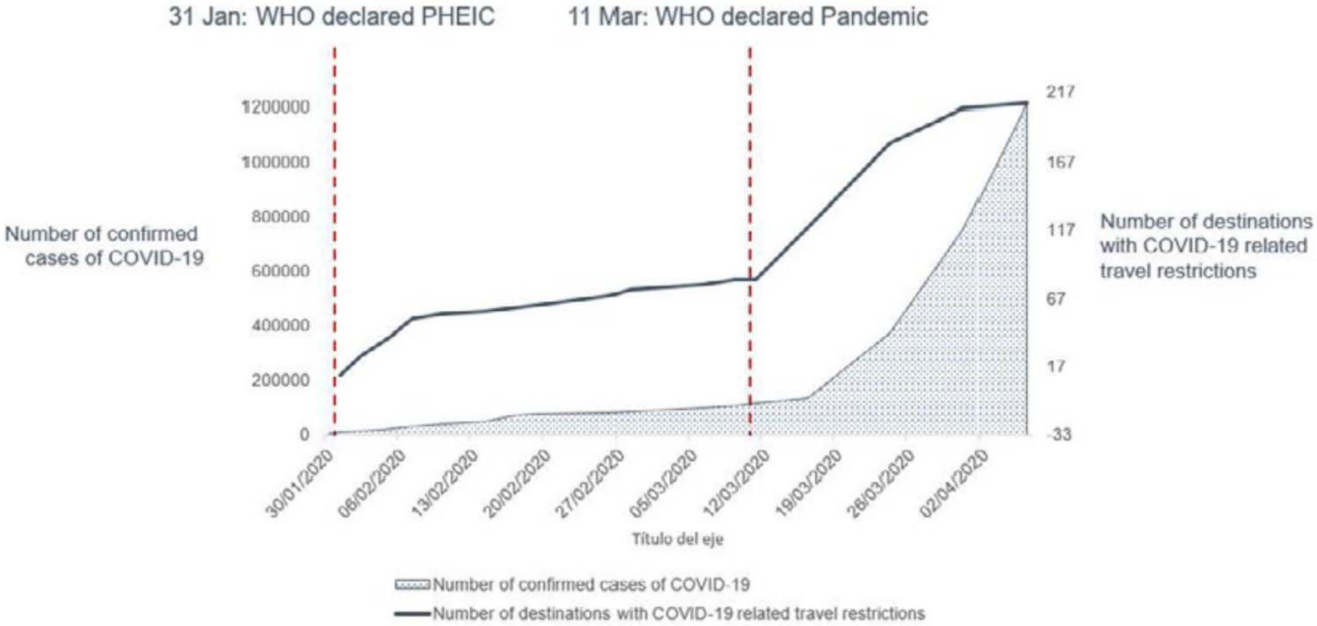
State/Territory with 50,000 or more confirmed cases*

*: Coronavirus Disease 2019 (COVID-19) Situation Report by WHO (30 April 2020)

Source: OAG scheduled data adjusted by ICAO estimates

Drastic reduction in air traffic amplified by travel restrictions amid COVID-19 outbreak

Number of confirmed cases and destinations with COVID-19-related travel restrictions



As of 6 April 2020, 96% of all world destinations have travel restrictions. About 90 destinations have completely or partially closed their borders for tourists, while another 44 destinations are closing their borders for specific countries of origin.

https://www.unwto.org/news/covid-19-response-travel-restrictions

Source: UNWTO COVID-19 Related Travel Restrictions – A Global Review for Tourism (dated 16 April 2020)

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 operation data and ICAO Statistical Reporting

Appendix B: Summary of Analysis by Other Organizations

ACI: Airport would lose USD 97.4 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	-114	-47.3%	-2.2	-51.2%
Asia/Pacific	-1,797	-52.9%	-29.4	-58.9%
Europe	-1,416	-57.1%	-37.1	-62.6%
Latin America/Caribbean	-289	-44.2%	-5.3	-50.5%
Middle East	-201	-46.9%	-7.0	-53.0%
North America	-859	-41.1%	-16.4	-47.3%
Total	**-4,676**	**-50.4%**	**-97.4**	**-56.7%**

https://aci.aero/wp-content/uploads/2020/05/200505-Third-Economic-Impact-Bulletin-FINAL.pdf

Source: ACI Advisory Bulletin – Economic Impact Assessment of COVID-19 on the Airport Business (dated 5 May 2020)

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

The analytical difference between ICAO and IATA estimates:

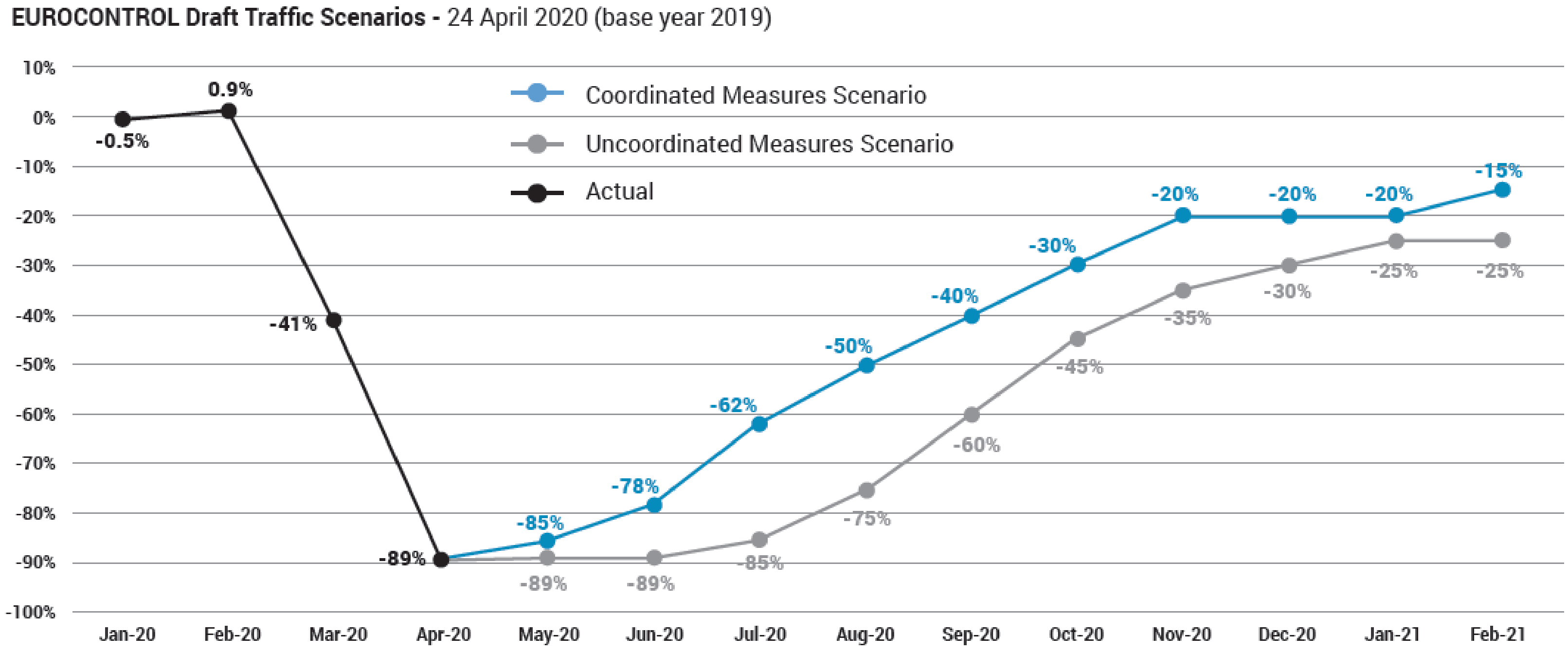
- **Traffic**: international only (ICAO) vs. both international and domestic (IATA)
- **Regional break-down**: by all traffic from States in each region (ICAO) vs. region of airline registration (IATA)
- **Baseline**: originally-planned i.e. 2020 business as usual scenario (ICAO) vs. 2019 level with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



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

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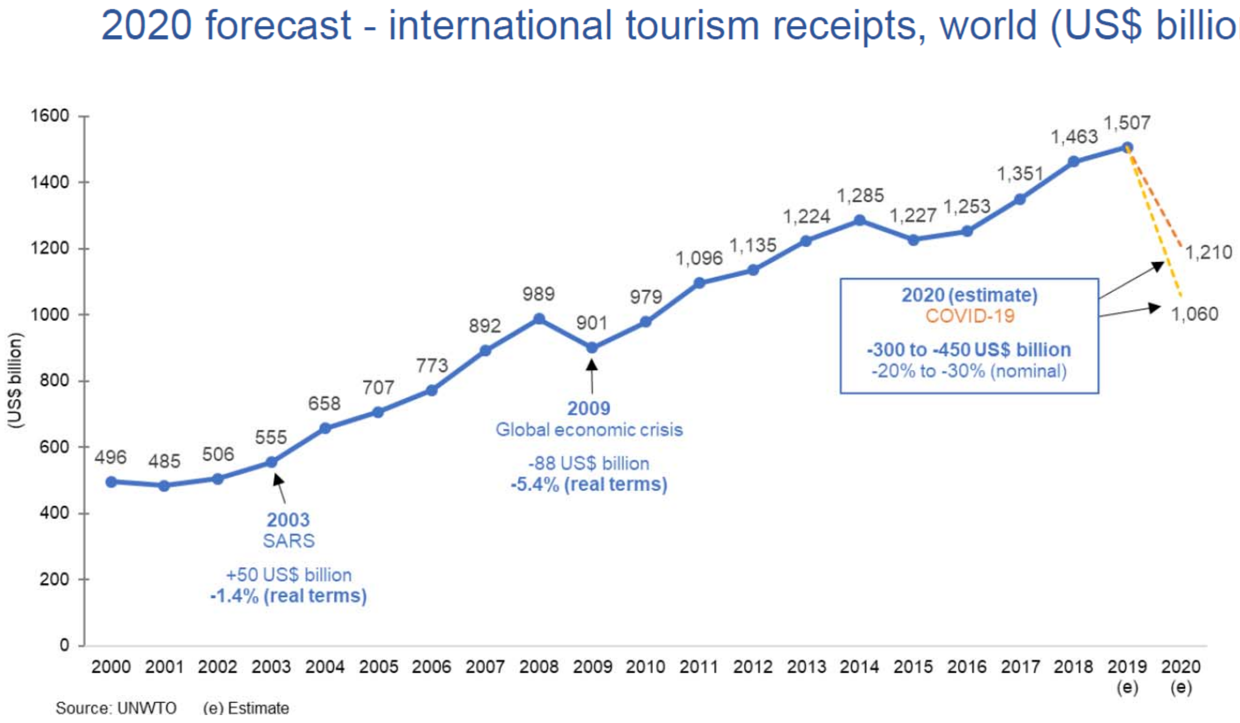
UNWTO: A loss of USD 300 to 450 billion in international tourism receipts in 2020



-290 to 440 million	International Tourist Arrivals
5 to 7 years	lost in number of tourists
-300 to 450 US$ bn	Tourism Exports (receipts)
1/3 of 1.5 US$ trillion	lost in Tourism Exports

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

Source: UNWTO Impact Assessment of the COVID-19 Outbreak on International Tourism

WTTC: A loss of 100 million jobs in travel and tourism sector in 2020

2020 forecasts – COVID-19 impact on travel and tourism sector

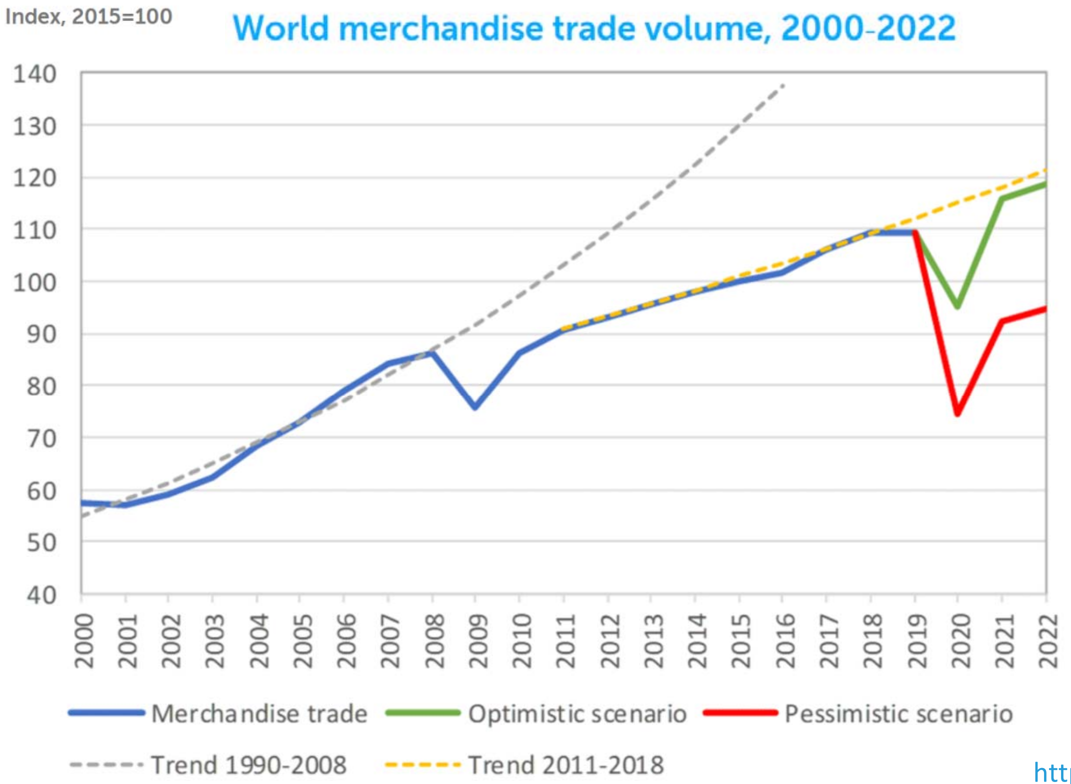
Region	**Potential Total Job Losses** (million)	**Total GDP Loss** (USD billion*)
Africa	-7.6	-52.8
Asia/Pacific	-63.4	-1,041.0
Europe	-13.0	-708.5
Latin America/Caribbean	-5.9	-110.2
Middle East	-2.6	-96.2
North America	-8.2	-680.7
Total	**-100.8**	**-2689.4**

* based on 2019 prices and exchange rates

https://wttc.org/About/News-Media/Press-Releases

Source: WTTC news release (dated 24 April 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: WTO news release (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

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

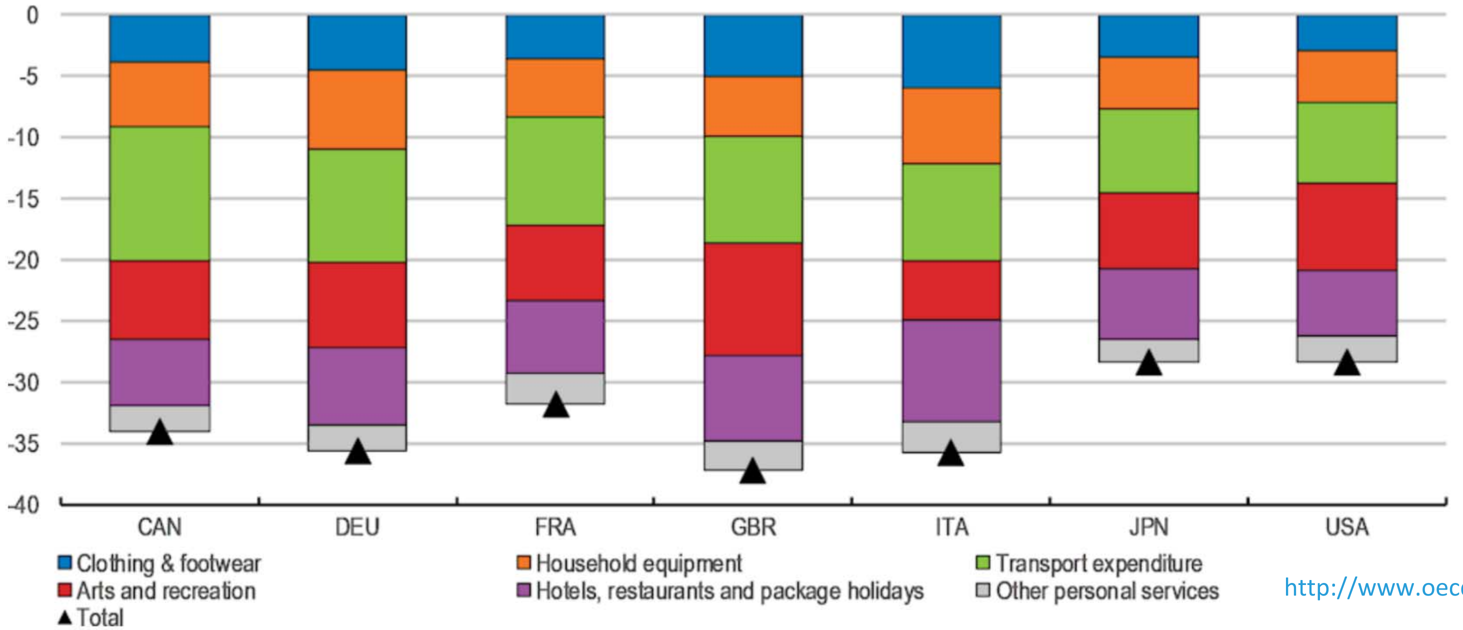
(real GDP, annual percent change)	2019	2020	2021
Emerging Markets and Developing Economies	**3.7**	**-1.0**	**6.6**
Emerging and Developing Asia	5.5	1.0	8.5
China	6.1	1.2	9.2
India	4.2	1.9	7.4
ASEAN-5	4.8	-0.6	7.8
Emerging and Developing Europe	2.1	-5.2	4.2
Russia	1.3	-5.5	3.5
Latin America and the Caribbean	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

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 the G7 economies

Per cent of total consumers’ expenditure



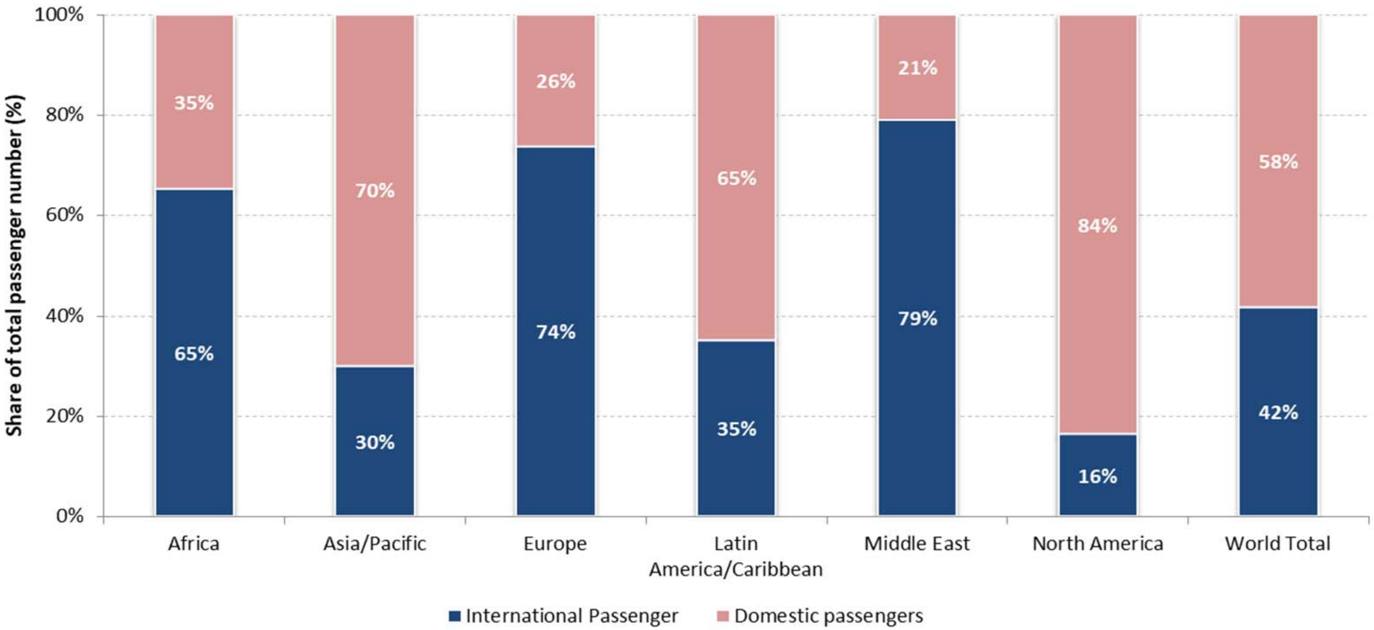
http://www.oecd.org/coronavirus/en/

Appendix C:
Preliminary Scenarios of Domestic Passenger Traffic

Figures and estimates herein are preliminary, incomplete and subject to substantial changes.
The contents will be gradually added with more robust analysis.

Domestic passenger traffic exhibits significant geographical disparity

Domestic-international passenger traffic mix vary significantly by State and region with United States and China dominating over 50% of world's domestic traffic

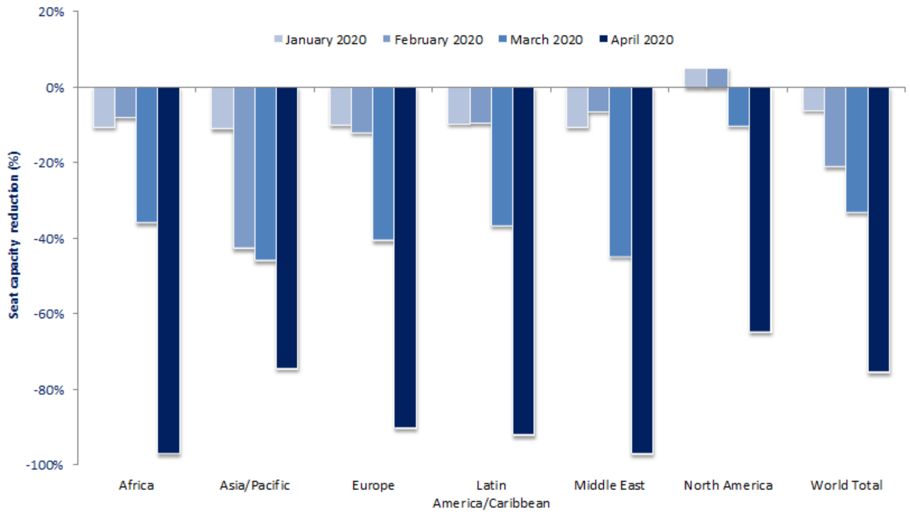


Source: ICAO Air Transport Statistics and Estimates (2019)

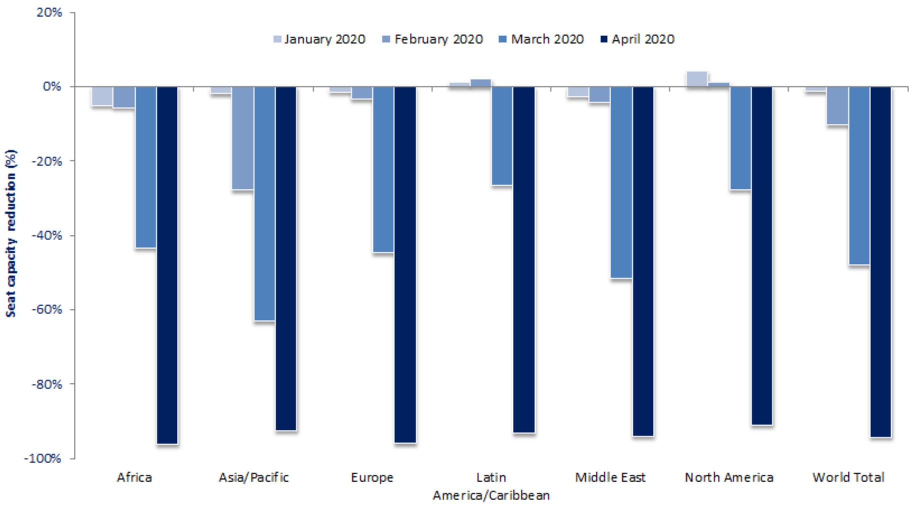
Domestic passenger traffic may be more resilient than international in some markets

Asia/Pacific and North America have experienced 20% to 25% less decline in domestic passenger traffic than international

Domestic seat capacity reduction (compared to baseline)



International seat capacity reduction (compared to baseline)



Source: ICAO ADS-B operation data

Domestic restart/recovery may go ahead of international

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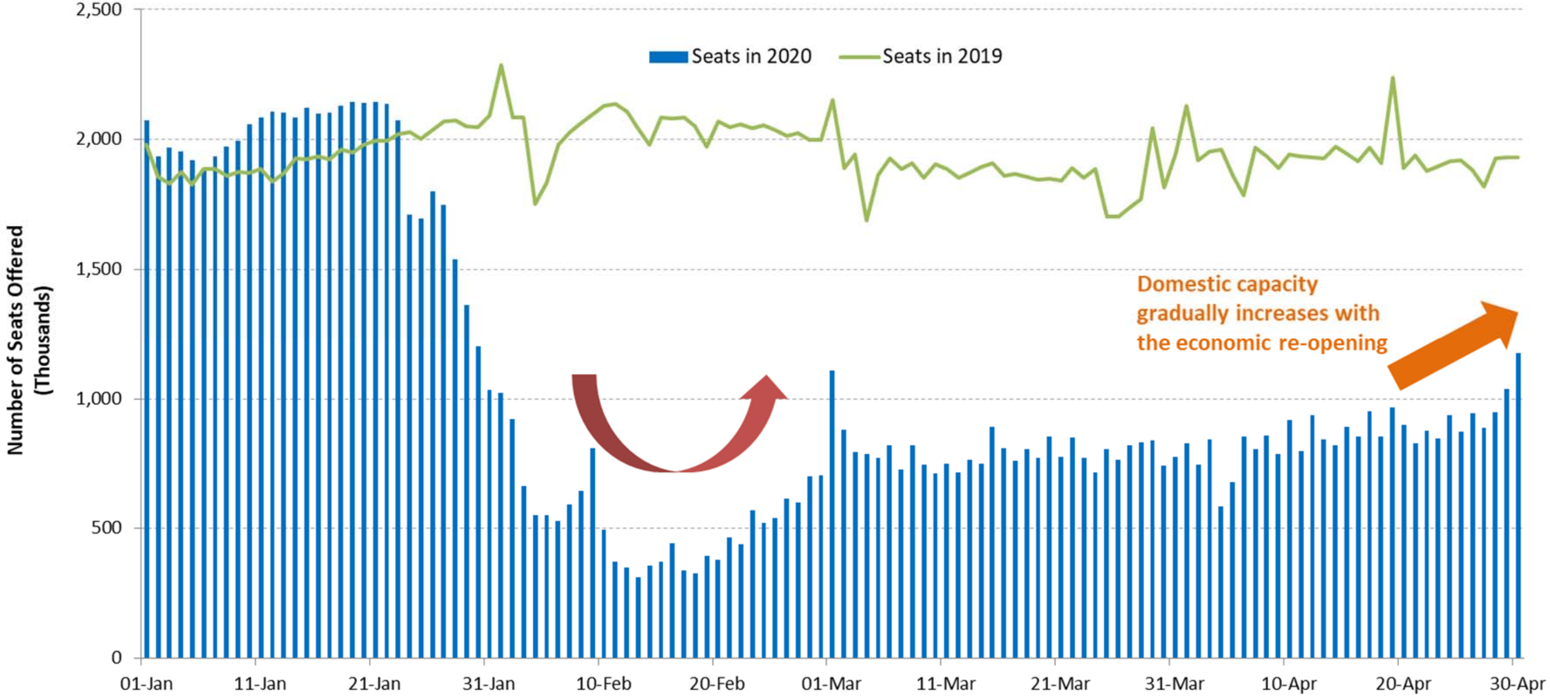
Domestic passenger traffic in China already restarted in mid-February, followed by the slow pace of recovery



Source: ICAO ADS-B operation data

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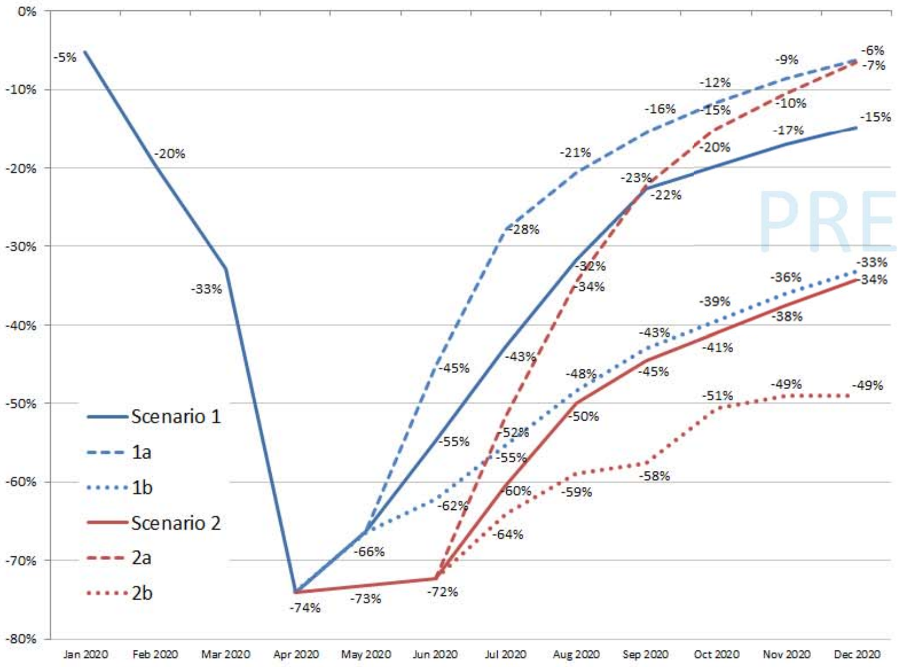
Illustrative 3 scenarios with 6 different paths similar to international passenger traffic

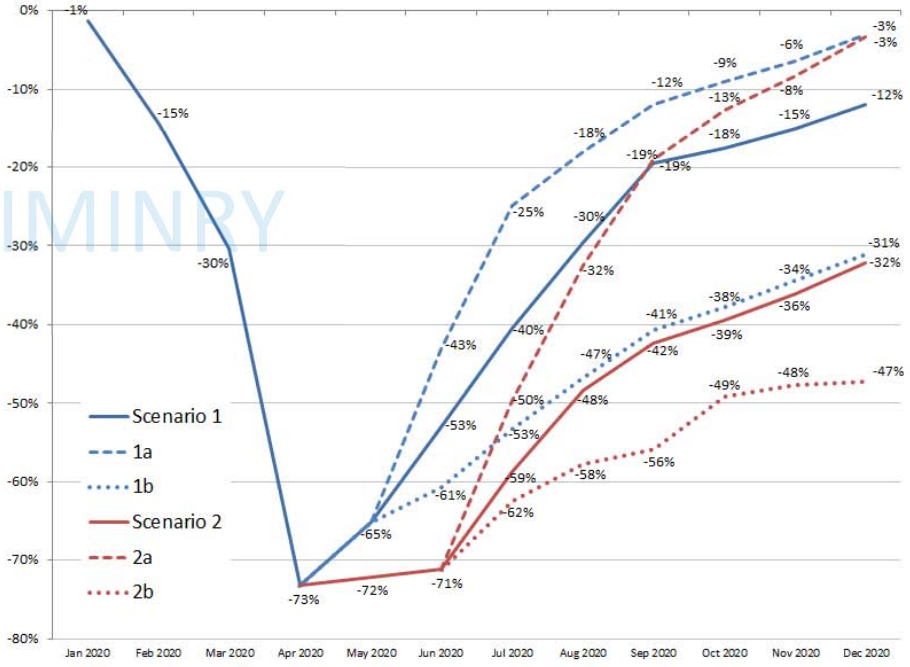
- **Baseline (counterfactual, no COVID-19 pandemic)**
  - **Originally-planned or business as usual**: trend line growth from 2019 level
- **Scenario 1 (V-shaped path, start restart/recovery in late May)**
  - **Path 1**: Gradual capacity recovery (in a soft patch in Q4) to 85% of Baseline level by December
  - **Path 1a**: Swift capacity rebound to 95% of Baseline pushed by pent-up demand
  - **Path 1b**: Slow progression to recover 75% capacity with sluggish demand growth
- **Scenario 2 (U-shaped path, start to pick up in July)**
  - **Path 2**: Gradual capacity recovery to 75% of Baseline by December but slower demand return
  - **Path 2a**: Swift capacity rebound to 93%, outpacing demand recovery
  - **Path 2b**: Capacity recovery only to 50% with respite and continuous demand slump

Scenarios 1 & 2: seat capacity reduction by 28 - 51% from Baseline and 25 - 49% from 2019

Comparison to Baseline



Comparison to 2019 (YoY)



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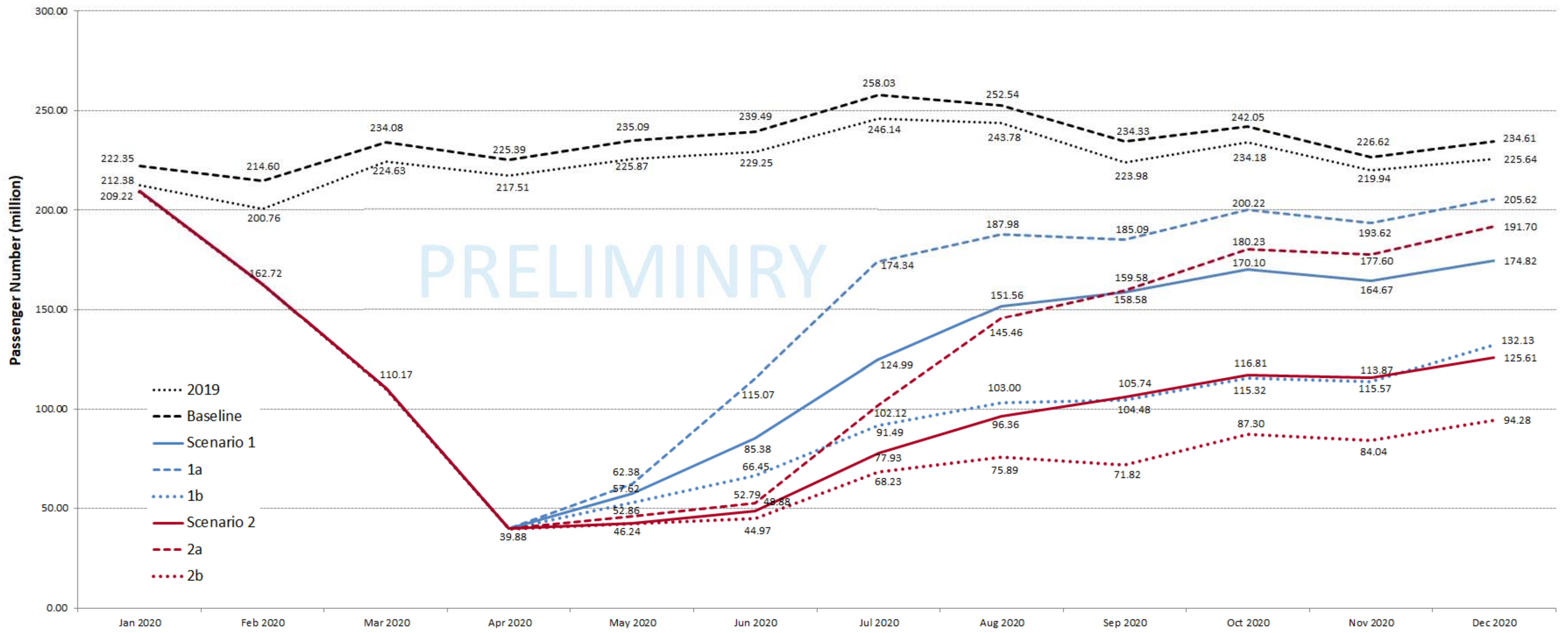
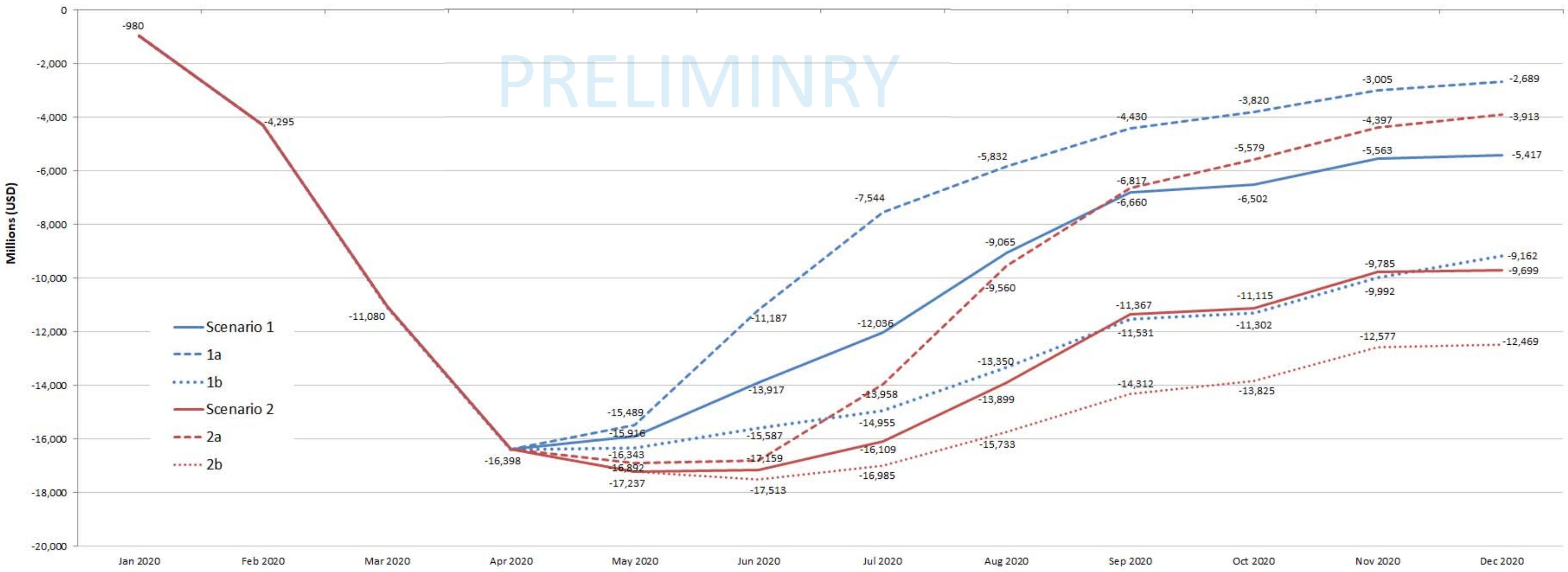
Scenarios 1 & 2: 973 - 1,728 million less passengers than Baseline and 858 - 1,613 million below 2019



Scenarios 1 & 2: USD 87 to 153 billion less revenues than Baseline



Appendix D: Airlines' Financial Analysis

Figures and estimates herein are 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%

Source: ICAO estimates based on ICAO Statistical Reporting

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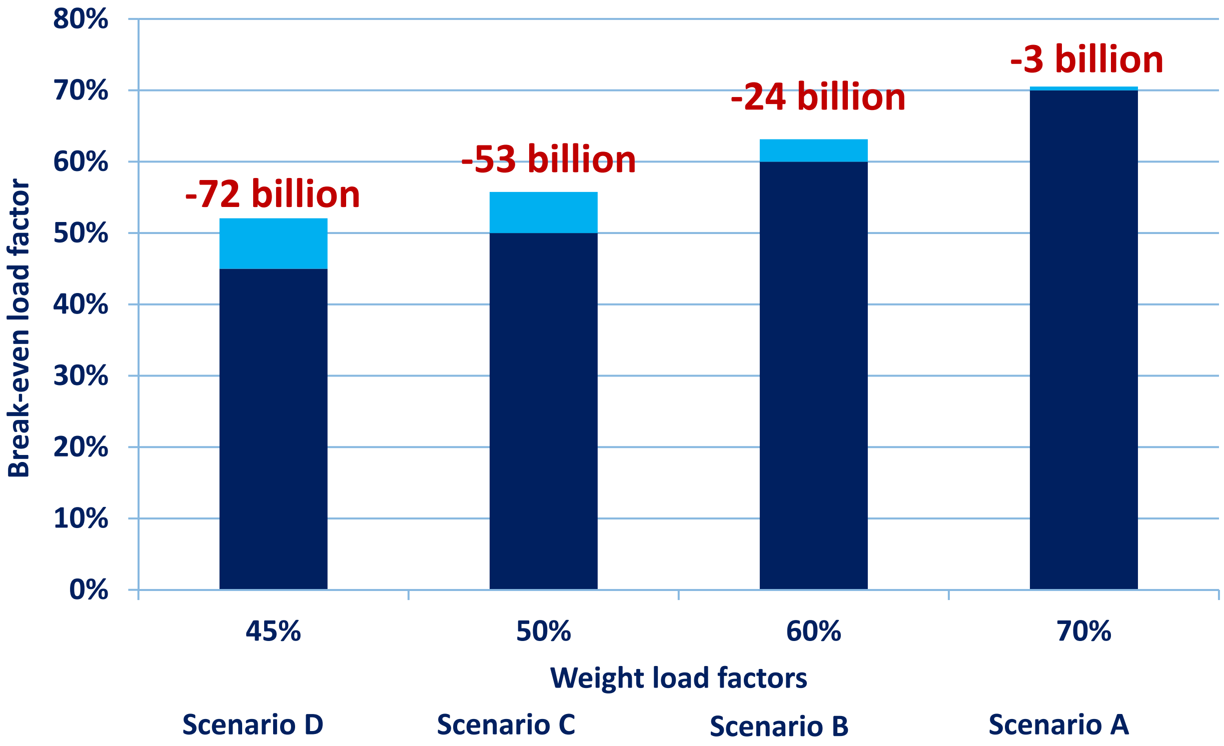
Airlines close to break even as load factor increases

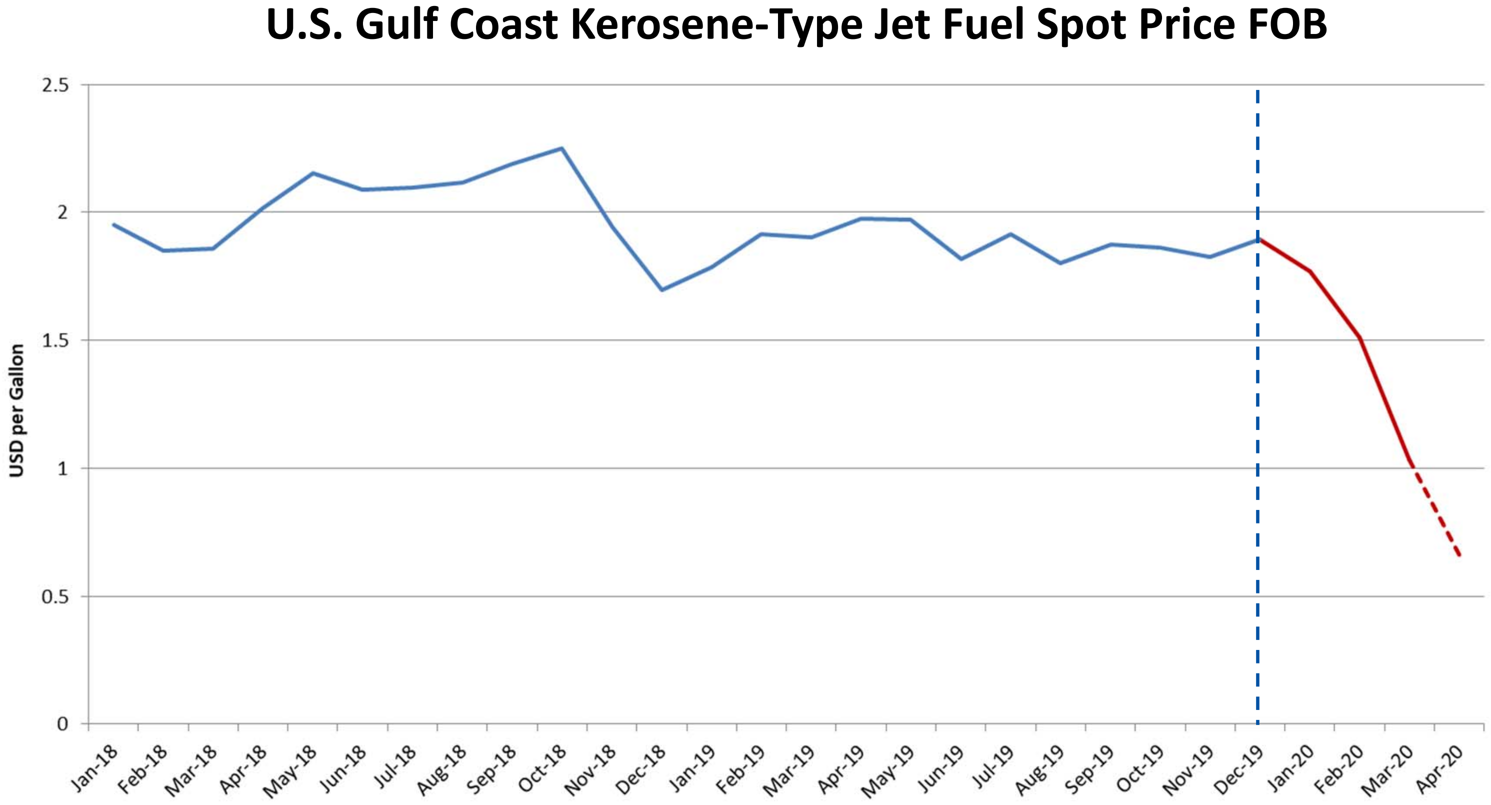


Operating loss
Excluding depreciation and amortizations costs

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 E: Route Group Level Estimates

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)

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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%	-498	-346	-1,850	-44	-31	-165
Africa - Asia/Pacific	International	4%	-19%	-46%	16	-118	-247	9	-65	-136
Africa - Middle East	International	-6%	-7%	-56%	-87	-182	-1,622	-19	-40	-355
Africa - North America	International	-9%	-3%	-26%	-17	-9	-89	-12	-6	-65
Africa & Middle East - Central America/Caribbean	International				0	0	0	0	0	0
Africa & Middle East - South America	International	2%	5%	-23%	4	-8	-55	1	-3	-23
Central America/Caribbean	Domestic	-8%	-7%	-25%	-425	-365	-1,878	-32	-27	-141
Central America/Caribbean - Europe	International	-1%	1%	-19%	21	11	-540	7	4	-184
Central America/Caribbean - North America	International	5%	4%	-20%	446	318	-3,552	70	50	-557
Central America/Caribbean - South America	International	5%	10%	-26%	71	104	-485	13	19	-89
China	Domestic	-13%	-76%	-62%	-10,017	-48,170	-39,210	-902	-4,335	-3,529
China - Europe	International	2%	-52%	-74%	59	-929	-1,553	18	-282	-471
China - Middle East	International	5%	-57%	-77%	36	-335	-495	9	-82	-121
China - North America	International	3%	-45%	-66%	47	-680	-1,106	19	-273	-444
China & South West Asia - North Asia	International	-1%	-44%	-84%	-113	-3,485	-6,026	-20	-620	-1,072
China & South West Asia - Pacific South East Asia	International	-2%	-47%	-72%	-354	-5,734	-8,323	-77	-1,241	-1,801
Europe	Domestic	-10%	-12%	-41%	-2,791	-3,398	-14,427	-226	-275	-1,169
Europe - Middle East	International	1%	-1%	-44%	298	-9	-4,279	55	-2	-787

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 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%	-41%	50	-5	-1,846	7	-1	-272
Europe - North America	International	5%	5%	-35%	431	249	-3,111	135	78	-976
Europe - North Asia	International	5%	4%	-42%	57	-11	-546	27	-5	-256
Europe - Pacific South East Asia	International	-3%	-1%	-14%	-37	-102	-576	-18	-51	-288
Europe - South America	International	-6%	-6%	-37%	-49	-69	-697	-18	-25	-249
Europe - South West Asia	International	1%	2%	-37%	44	-61	-988	12	-16	-266
Europe - Sub Saharan Africa	International	2%	3%	-27%	92	42	-765	39	18	-324
Intra Africa	International	-10%	-11%	-44%	-288	-381	-1,391	-38	-50	-182
Intra Central America/Caribbean	International	4%	4%	-27%	67	40	-595	6	3	-50
Intra China & South West Asia	International	-10%	-61%	-79%	-538	-3,067	-4,091	-69	-390	-521
Intra Europe	International	-2%	-4%	-47%	-180	-2,303	-29,696	-18	-234	-3,023
Intra Middle East	International	-6%	-6%	-68%	-73	-219	-2,734	-8	-25	-313
Intra North America	International	3%	3%	-24%	111	14	-1,295	15	2	-173
Intra North Asia	International	-2%	-3%	-79%	-34	-224	-1,094	-2	-12	-59
Intra Pacific South East Asia	International	-1%	-6%	-46%	-151	-1,639	-5,038	-23	-244	-750
Intra South America	International	-10%	-7%	-40%	-195	-144	-934	-34	-25	-162
Latin America/Caribbean - China	International	5%			0	0	0	0	0	0
Latin America/Caribbean - North Asia & Pacific South East Asia	International	3%	0%	-18%	2	-8	-30	1	-5	-20

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 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%	-128	-227	-1,896	-12	-21	-176
Middle East - North America	International	2%	3%	-27%	42	20	-339	20	10	-161
Middle East - North Asia & Pacific South East Asia	International	-2%	-2%	-36%	-22	-331	-1,360	-6	-89	-364
Middle East - South West Asia	International	-3%	-2%	-44%	-132	-627	-2,951	-21	-99	-466
North America	Domestic	5%	5%	-10%	5,059	4,466	-36,200	587	519	-4,203
North America - North Asia	International	5%	5%	-25%	68	-89	-618	21	-28	-195
North America - Pacific South East Asia	International	4%	6%	-18%	31	-45	-295	25	-36	-235
North America - South America	International	5%	5%	-28%	79	59	-618	31	23	-243
North America - South West Asia	International	4%	5%	-28%	7	-13	-94	5	-10	-69
North Asia	Domestic	-2%	-4%	-21%	-37	-1,170	-7,027	-2	-59	-351
North Asia - Pacific South East Asia	International	0%	-8%	-64%	-47	-1,069	-3,478	-12	-276	-899
Pacific South East Asia	Domestic	-11%	-11%	-33%	-2,561	-3,602	-13,102	-157	-221	-803
South America	Domestic	-10%	-10%	-41%	-1,539	-1,706	-7,609	-130	-144	-642
South West Asia	Domestic	-14%	-14%	-38%	-2,440	-2,434	-7,330	-150	-149	-449
Domestic		-6%	-21%	-33%	-15,377	-56,950	-130,529	-1,067	-4,744	-11,628
International		-1%	-10%	-48%	-241	-21,041	-93,550	151	-4,030	-16,623
Total		-4%	-17%	-39%	-15,618	-77,991	-224,079	-916	-8,773	-28,252

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%	88	270	-1,284	8	24	-115
Africa - Asia/Pacific	International	18%	-1%	-38%	67	-47	-192	37	-26	-106
Africa - Middle East	International	7%	10%	-50%	248	169	-1,306	54	37	-286
Africa - North America	International	8%	22%	-13%	16	28	-57	12	21	-42
Africa & Middle East - Central America/Caribbean	International		-100%		0	0	0	0	0	0
Africa & Middle East - South America	International	-6%	2%	-27%	-7	-12	-62	-3	-5	-26
Central America/Caribbean	Domestic	8%	12%	-12%	411	461	-1,100	31	35	-82
Central America/Caribbean - Europe	International	-2%	3%	-21%	12	42	-568	4	14	-194
Central America/Caribbean - North America	International	0%	4%	-24%	95	318	-3,971	15	50	-623
Central America/Caribbean - South America	International	4%	8%	-28%	52	90	-522	10	16	-95
China	Domestic	-4%	-73%	-58%	-4,801	-42,509	-34,245	-432	-3,826	-3,082
China - Europe	International	4%	-49%	-73%	101	-821	-1,481	31	-249	-449
China - Middle East	International	6%	-56%	-77%	45	-332	-505	11	-81	-124
China - North America	International	-6%	-48%	-70%	-92	-761	-1,282	-37	-306	-515
China & South West Asia - North Asia	International	22%	-32%	-82%	1,237	-2,322	-4,988	220	-413	-887
China & South West Asia - Pacific South East Asia	International	7%	-46%	-71%	657	-5,325	-7,990	142	-1,153	-1,729
Europe	Domestic	-3%	-2%	-35%	-975	-885	-11,884	-79	-72	-963
Europe - Middle East	International	5%	6%	-43%	598	426	-4,090	110	78	-753

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
Europe - North Africa	International	-1%	6%	-42%	55	161	-1,892	8	24	-279
Europe - North America	International	-1%	4%	-36%	119	226	-3,280	37	71	-1,029
Europe - North Asia	International	4%	6%	-42%	53	7	-539	25	3	-253
Europe - Pacific South East Asia	International	5%	7%	-19%	120	17	-671	60	8	-335
Europe - South America	International	-3%	0%	-37%	-3	6	-686	-1	2	-245
Europe - South West Asia	International	-8%	-4%	-43%	-143	-168	-1,188	-39	-45	-320
Europe - Sub Saharan Africa	International	1%	5%	-27%	62	84	-779	26	36	-330
Intra Africa	International	2%	5%	-36%	29	-17	-1,054	4	-2	-138
Intra Central America/Caribbean	International	1%	4%	-30%	22	48	-647	2	4	-54
Intra China & South West Asia	International	-2%	-57%	-77%	-105	-2,643	-3,640	-13	-336	-463
Intra Europe	International	-1%	3%	-43%	946	1,062	-26,168	96	108	-2,664
Intra Middle East	International	-2%	0%	-67%	91	-13	-2,559	10	-2	-293
Intra North America	International	-4%	-1%	-30%	-76	-67	-1,527	-10	-9	-204
Intra North Asia	International	-32%	-31%	-85%	-617	-709	-1,627	-33	-38	-87
Intra Pacific South East Asia	International	7%	2%	-43%	540	-1,063	-4,605	80	-158	-686
Intra South America	International	-9%	-4%	-37%	-183	-69	-851	-32	-12	-148
Latin America/Caribbean - China	International	-66%	-100%	-100%	-6	-8	-8	-4	-6	-6
Latin America/Caribbean - North Asia & Pacific South East Asia	International	3%	1%	-19%	2	-8	-31	2	-5	-21

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
Middle East	Domestic	-7%	1%	-43%	28	14	-1,759	3	1	-164
Middle East - North America	International	5%	7%	-28%	63	46	-340	30	22	-162
Middle East - North Asia & Pacific South East Asia	International	0%	3%	-36%	13	-208	-1,346	3	-56	-361
Middle East - South West Asia	International	3%	9%	-40%	184	-140	-2,570	29	-22	-406
North America	Domestic	3%	6%	-12%	3,972	5,437	-37,828	461	631	-4,392
North America - North Asia	International	4%	5%	-27%	51	-87	-642	16	-27	-203
North America - Pacific South East Asia	International	6%	13%	-18%	52	-1	-296	41	-1	-236
North America - South America	International	-8%	-3%	-34%	-115	-35	-744	-45	-14	-293
North America - South West Asia	International	20%	24%	-15%	35	15	-63	26	11	-47
North Asia	Domestic	6%	6%	-16%	805	-100	-6,232	40	-5	-312
North Asia - Pacific South East Asia	International	16%	9%	-60%	674	-365	-3,036	174	-94	-784
Pacific South East Asia	Domestic	6%	8%	-21%	1,852	1,063	-8,713	114	65	-534
South America	Domestic	2%	4%	-29%	625	513	-4,950	53	43	-418
South West Asia	Domestic	1%	7%	-23%	149	731	-4,059	9	45	-249
Domestic		1%	-13%	-28%	2,154	-35,004	-112,055	207	-3,058	-10,309
International		2%	-5%	-46%	4,893	-12,477	-87,807	1,098	-2,555	-15,876
Total		1%	-10%	-35%	7,047	-47,481	-199,861	1,305	-5,613	-26,186

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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