AUM 2020

The impacts of COVID-19 pandemic in transport and land use: interpreting the results of WCTRS expert survey

22 October 2020

- Prof. Dr-Eng. Yoshitsugu Hayashi, Chubu University

Full Member of Club of Rome, Ex-President & Chair of COVID-19 Taskforce of WCTRS

- Junyi Zhang, Hiroshima University

Co-Chair, COVID-19 Taskforce of WCTRS

- Hiroyuki Takeshita, Chubu University

WCTRS COVID-19 Task Force

https://www.wctrs-society.com/about-wctrs/wctrs-covid-19-task-force/

Chair of WCTRS COVID-TF

- **Yoshitsugu Hayashi**, Immediate Ex-President of WCTRS; & Director, Center for Sustainable Development and Global Smart City, Chubu University, Japan

Co-Chairs of WCTRS COVID-TF

- **Junyi Zhang**, Prof., Mobilities and Urban Policy Lab, Graduate School of Advanced Science and Engineering; Director of ASMO Center, Hiroshima University, Japan

Members of WCTRS COVID-TF

- **Greg Marsden**, Secretary General of WCTRS; Prof., ITS, University of Leeds, UK
- **E. Seetha Ram**, Dr. Eng., Senior Consulting Specialist, Asian Development Bank Institute
- **Holger Dalkmann,** Founder, Sustain 2030 Founder

Advisors

- **Tae Oum**, President of WCTRS; Emeritus Prof., University of British Columbia, Canada
- **Werner Rothengatter**, Ex-President of WCTRS, Emeritus Prof., Karlsruhe Institute of Technology, German

Content 1

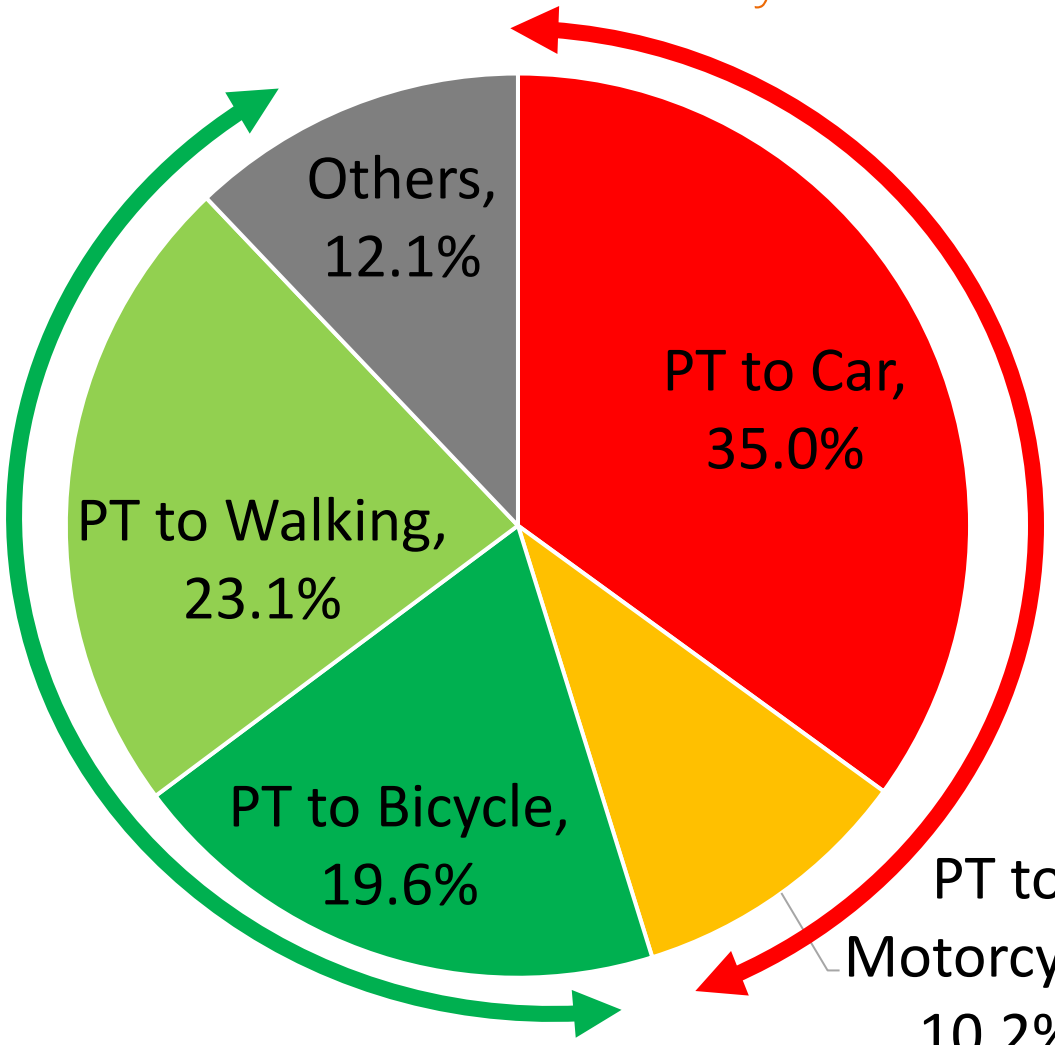
What have happened in Transport under COVID-19?

Modal shifts

(subjective observations, multiple choices)

<WCTRS Taskforce Survey 2020 >

PT→Low Carbon Mode(42.7%)



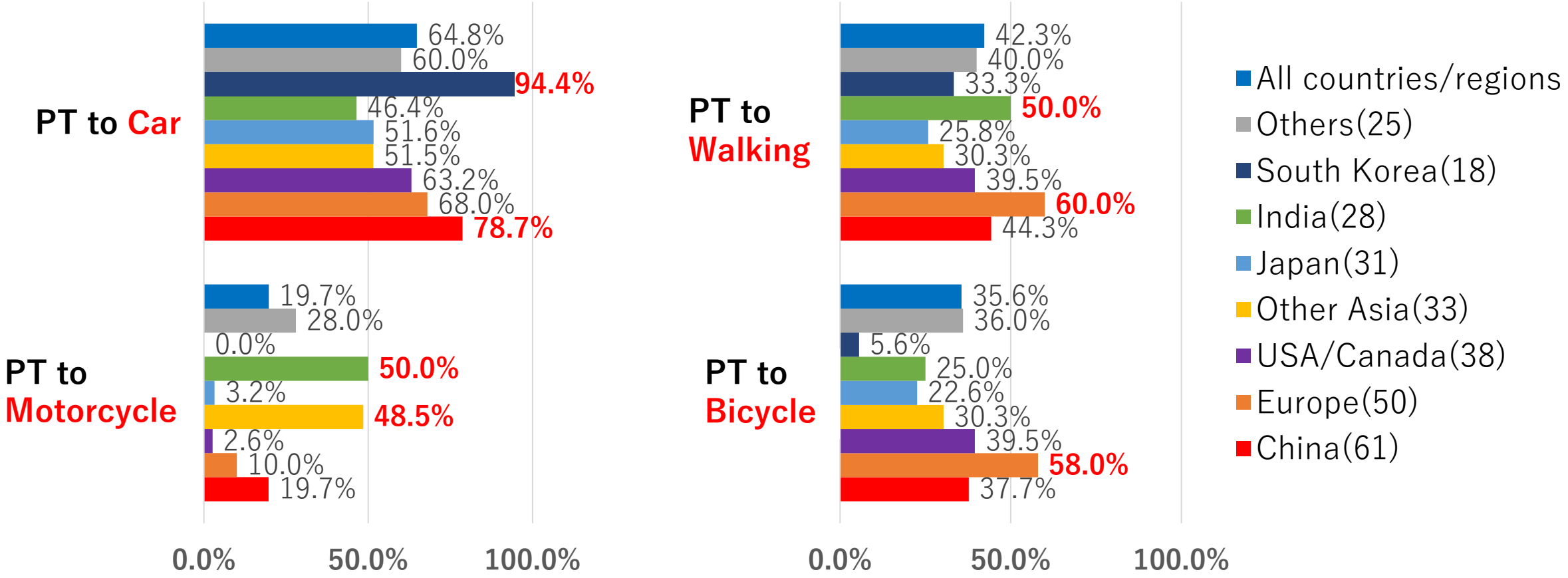
PT→High Carbon Mode(45.2%)

$S_{high\text{-}carbon}$ ↗

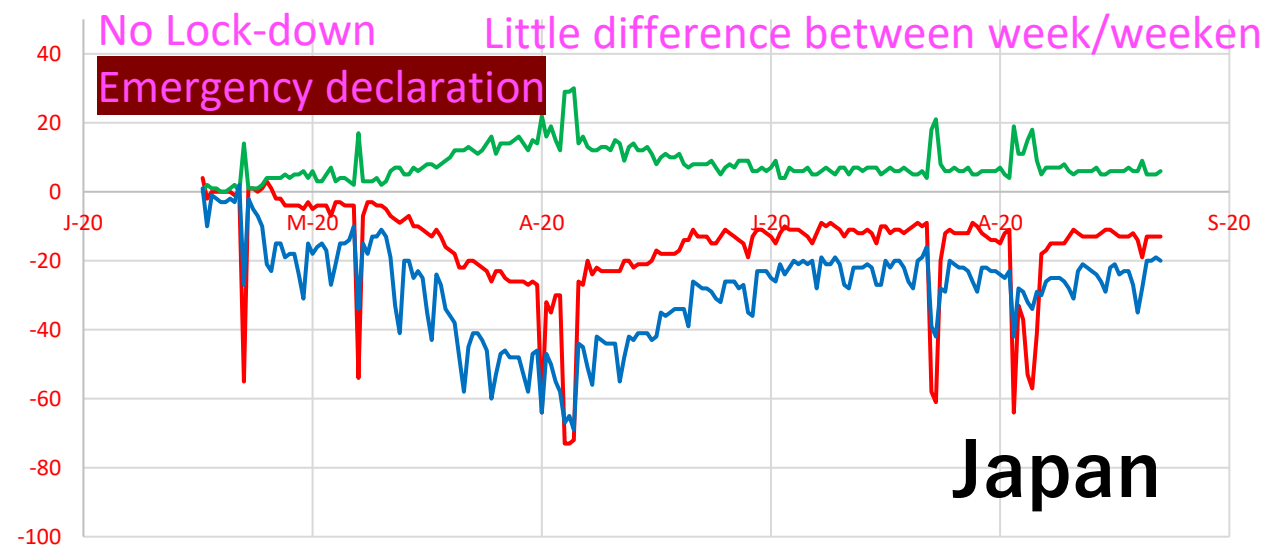
Modal shifts

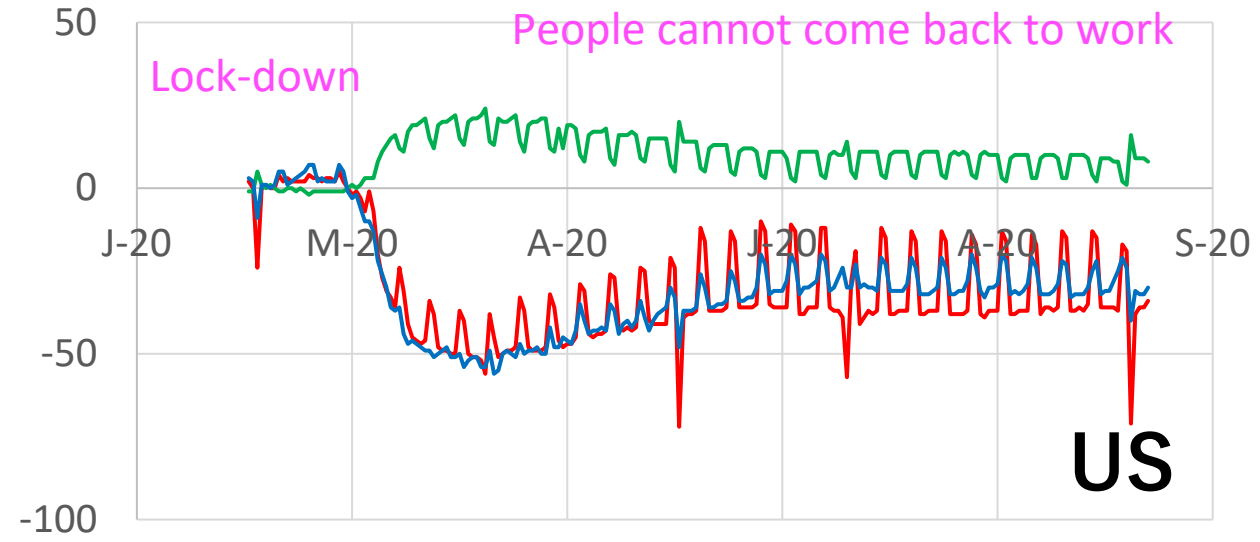
(subjective observations, multiple choices)

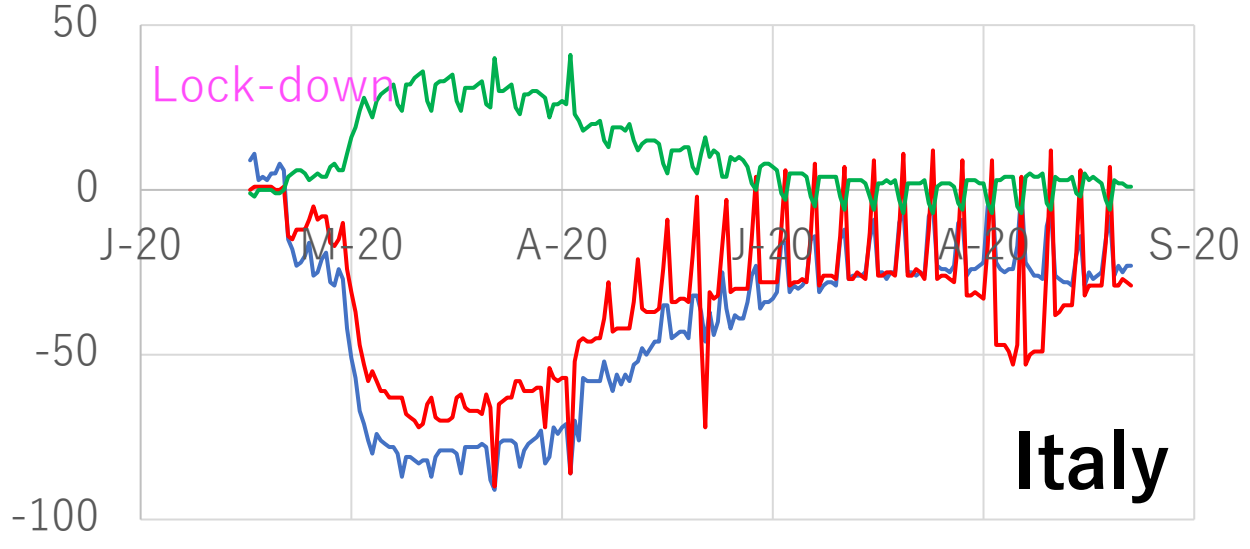
<WCTRS Taskforce Survey 2020 >



Where did people go/stay during the pandemic?



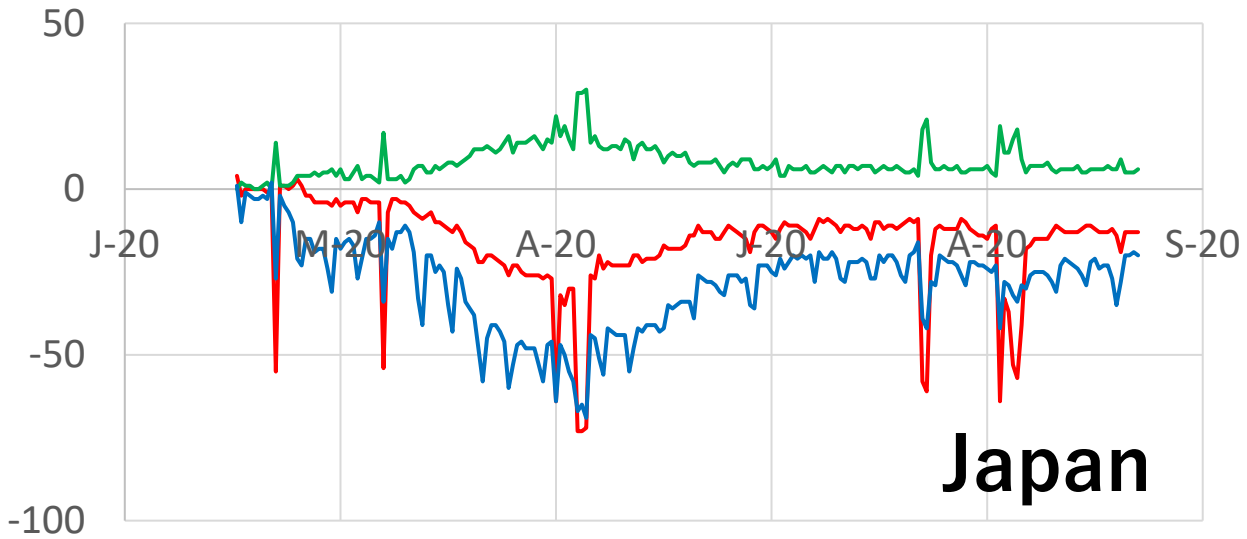


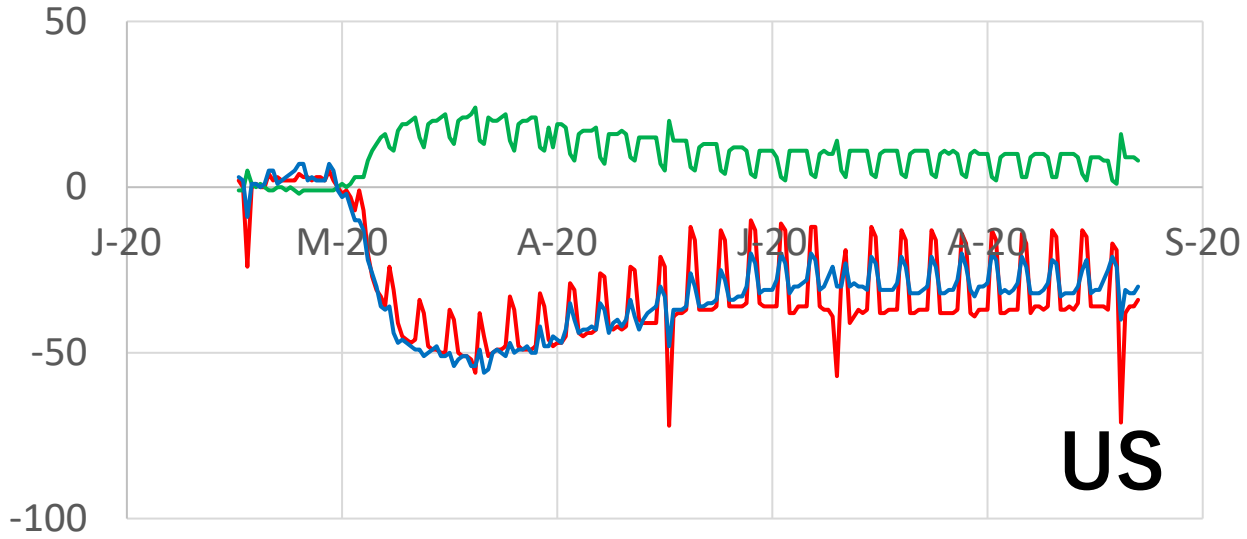


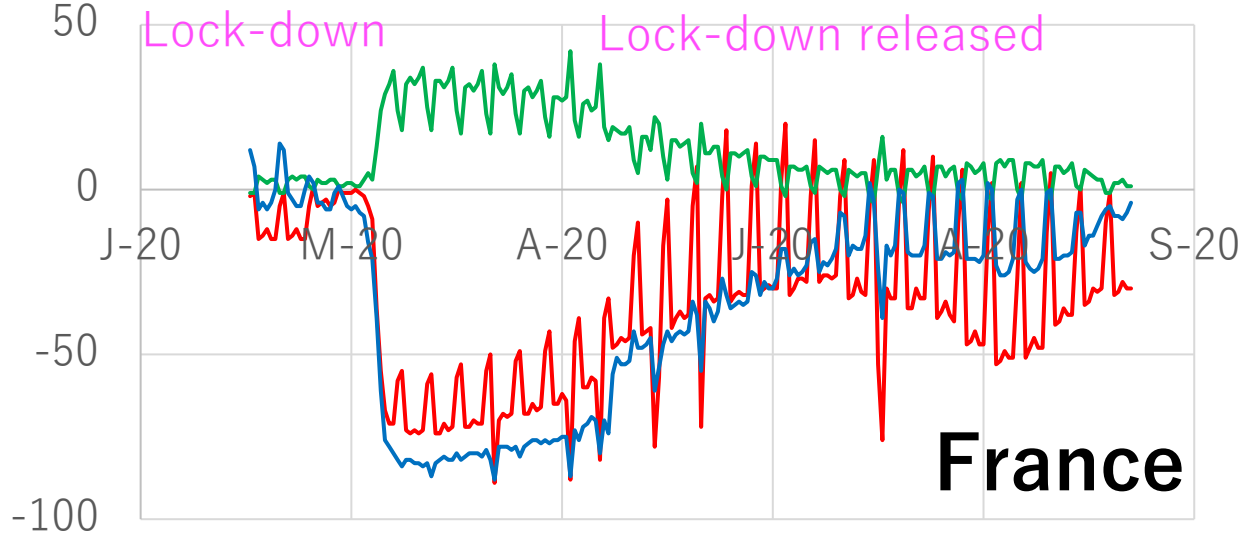
Workplaces Residential Transit Stations

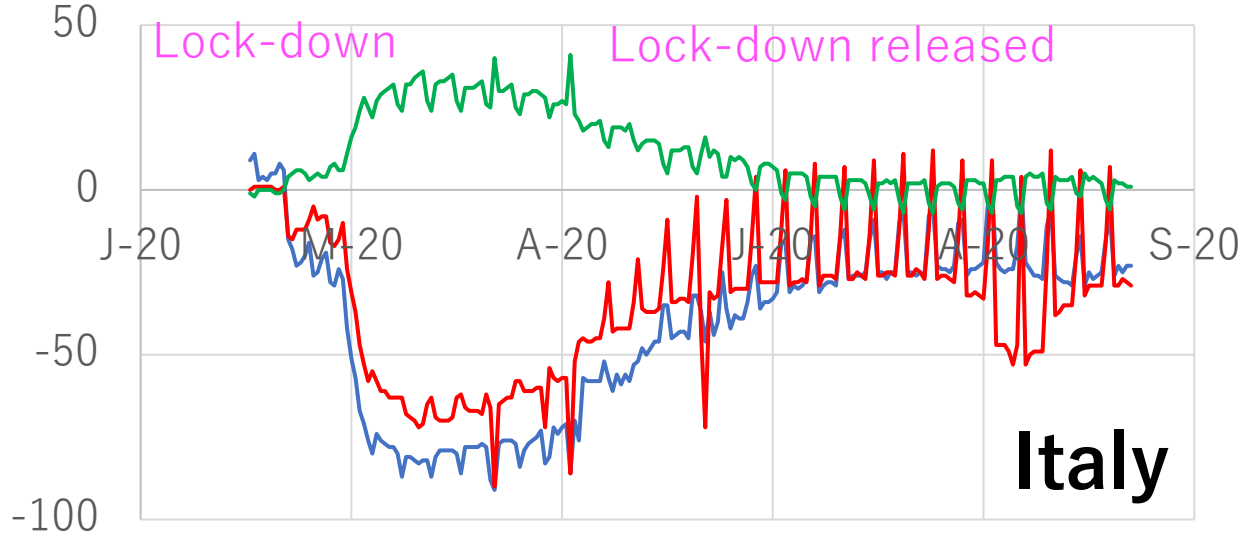
Reference: Google Community Mobility Report

Where did people go/stay during the pandemic?









Workplaces Residential Transit Stations

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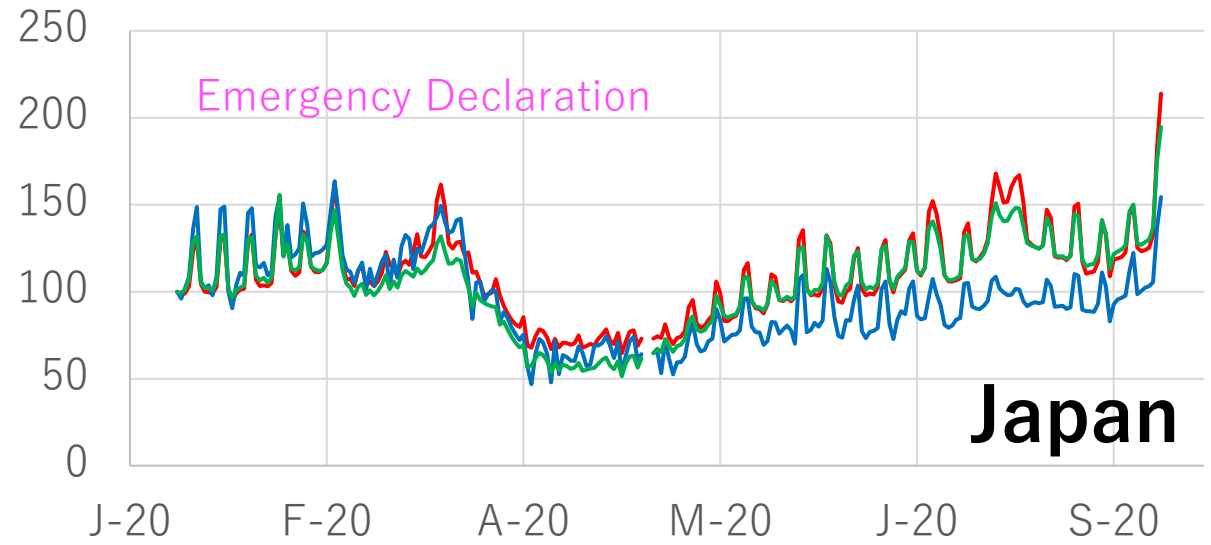
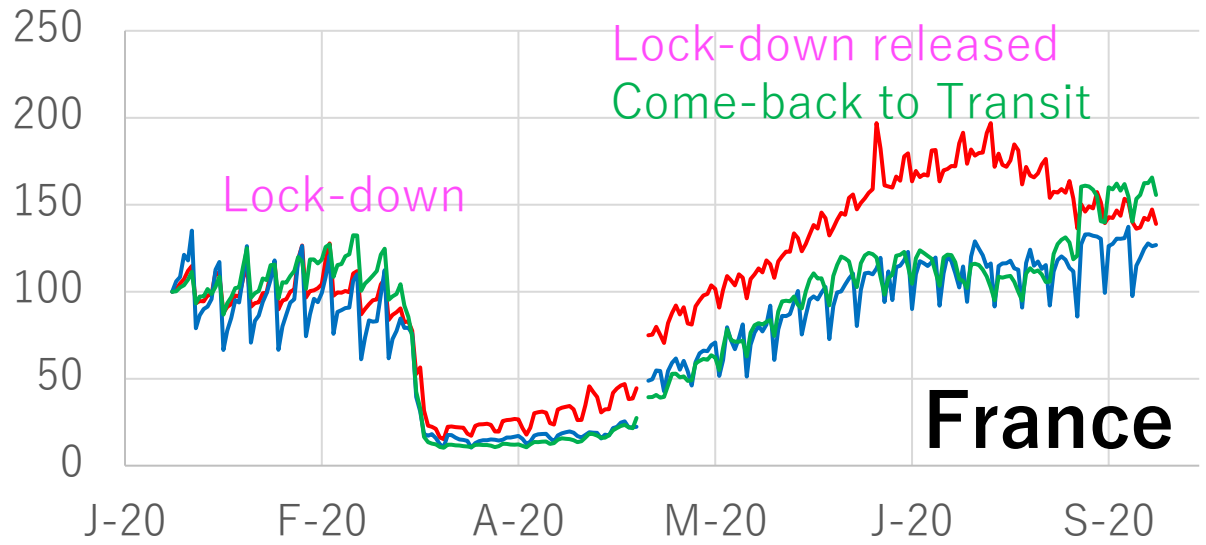
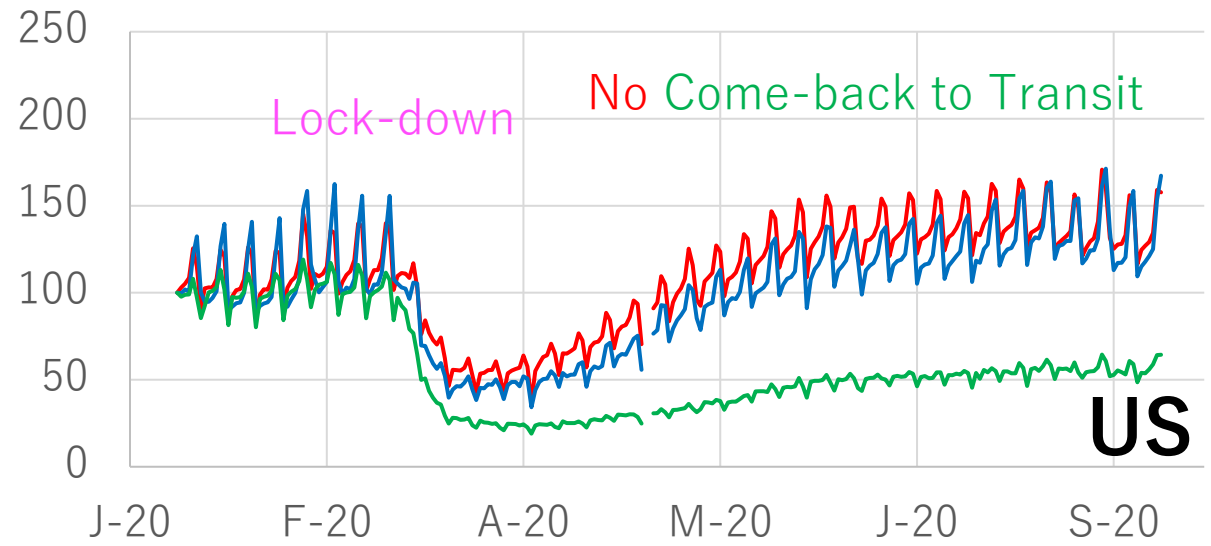
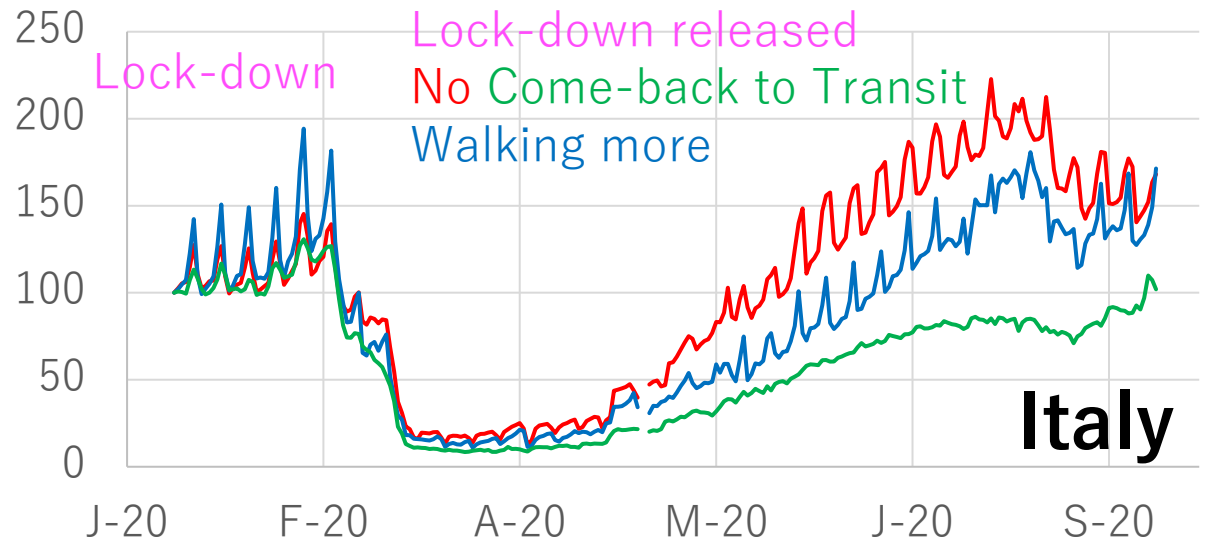
Trend in Transport Volume









Driving Transit Walking

Reference: Apple's COVID-19 mobility trends reports

Content 2

Recommended Measures and Actions

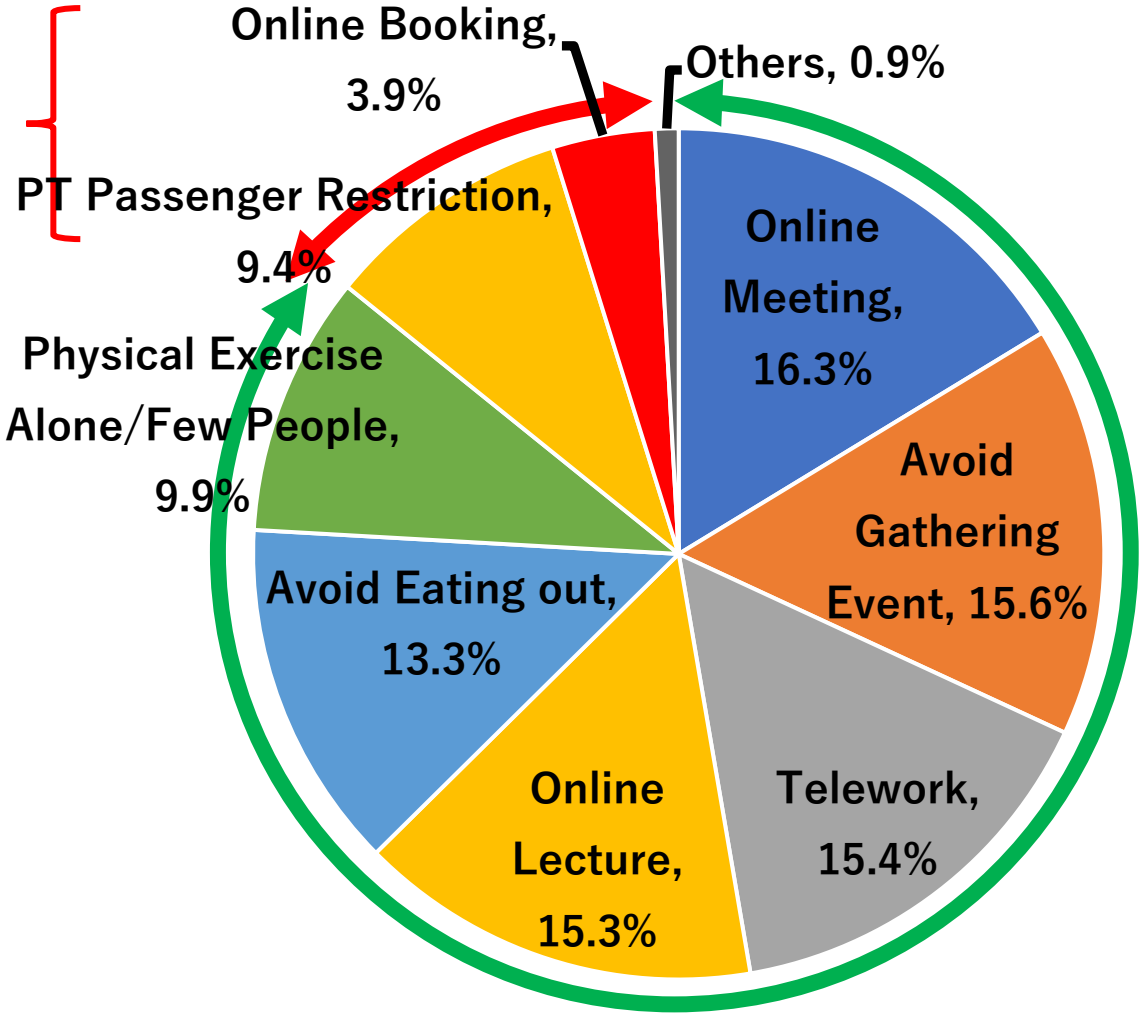
Recommended actions during COVID-19 pandemic

(multiple choices)

<WCTRS Taskforce Survey 2020 >

Increasing Emission Factor
→Contribute to CO2 Increase from PT

I_{PT}



A_p

Decreasing Passenger Volume
→Contribute to CO2 Reduction

Experts' opinions on long-term changes (1)

More and more inter-city **business trips for meetings** will be replaced by **online meeting**.

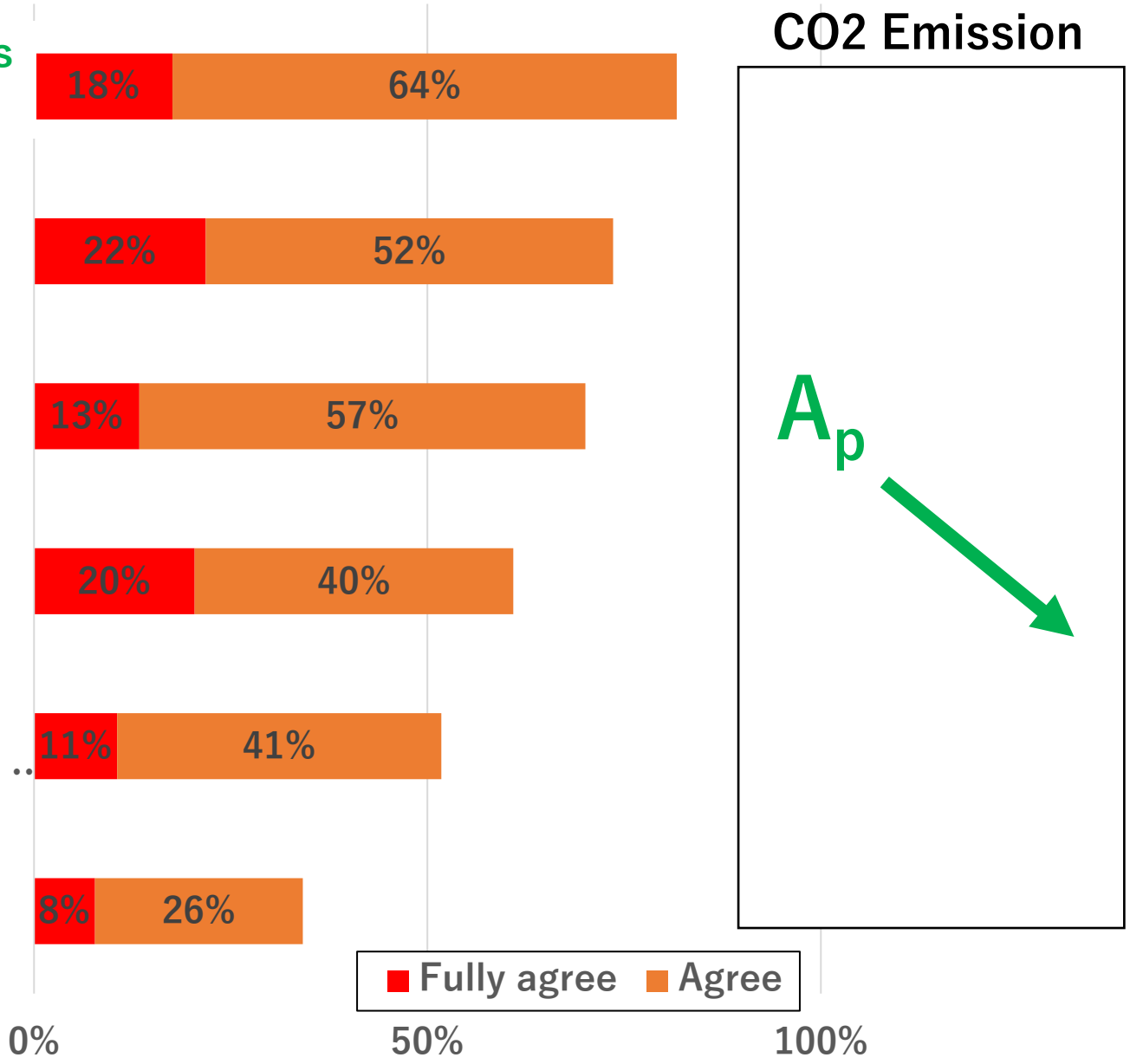
Online services of government, bank, ticket purchase, etc. will become a standard service.

More and more intra-city **business trips for meetings** will be replaced by **online meeting**.

Online shopping will become the most popular shopping activity.

The society will become **more isolated** due to the progress of **online activities** and **smart technologies** (AI, IoT, robotics, etc.).

Online education will be a standard model of education.



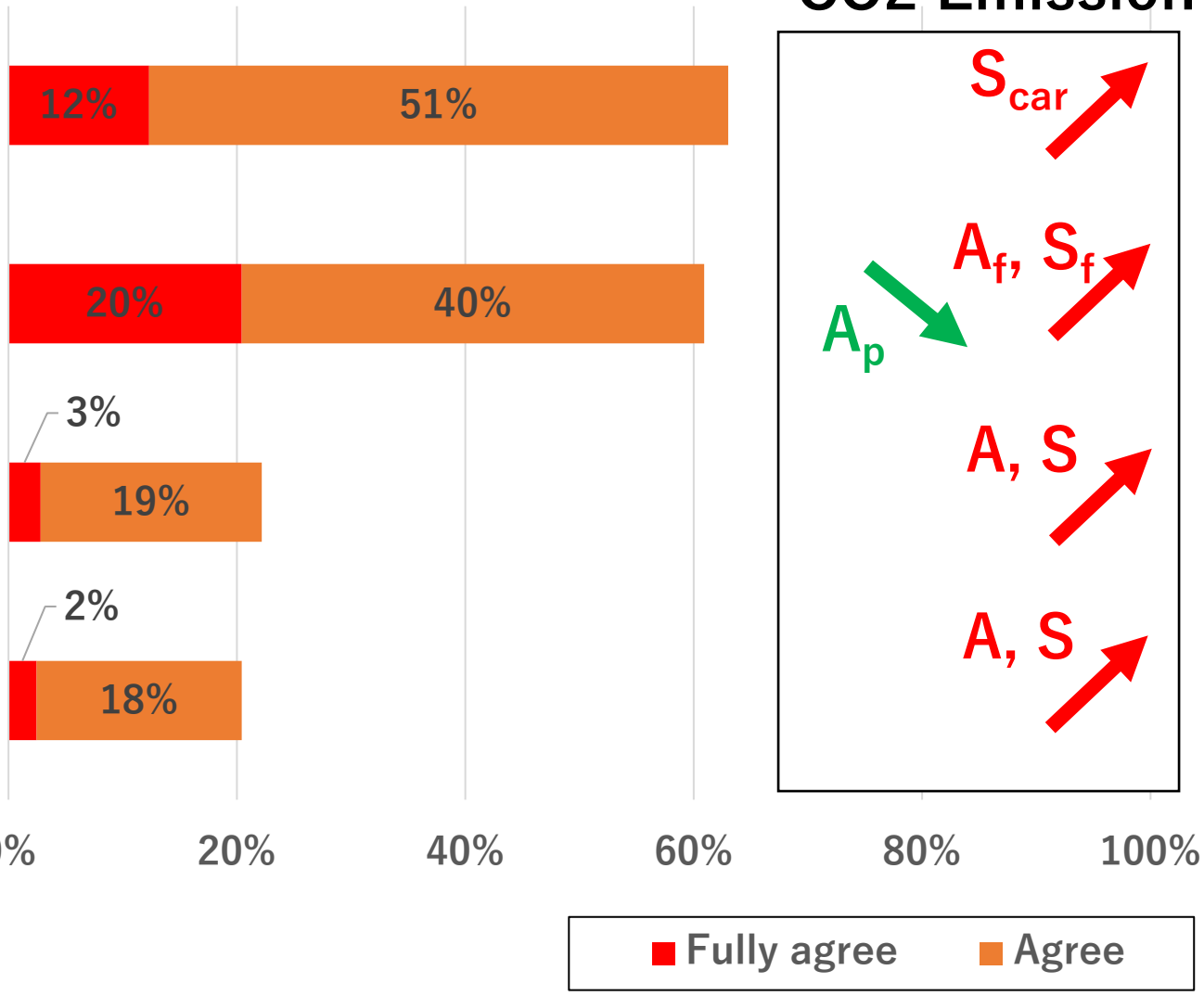
Experts' opinions on long-term changes (2)

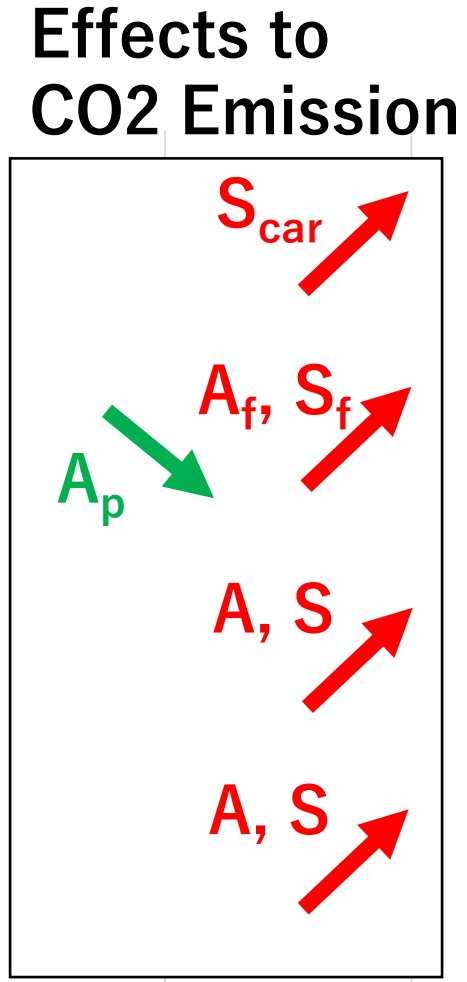
The **car dependence** will become more obvious due to adverse reactions to **crowded public transport** during the COVID-19 pandemic.

Online shopping will become the most popular shopping activity.

More and more people will **out-migrate from populated cities.**

More and more people will choose to **live far from city center.**



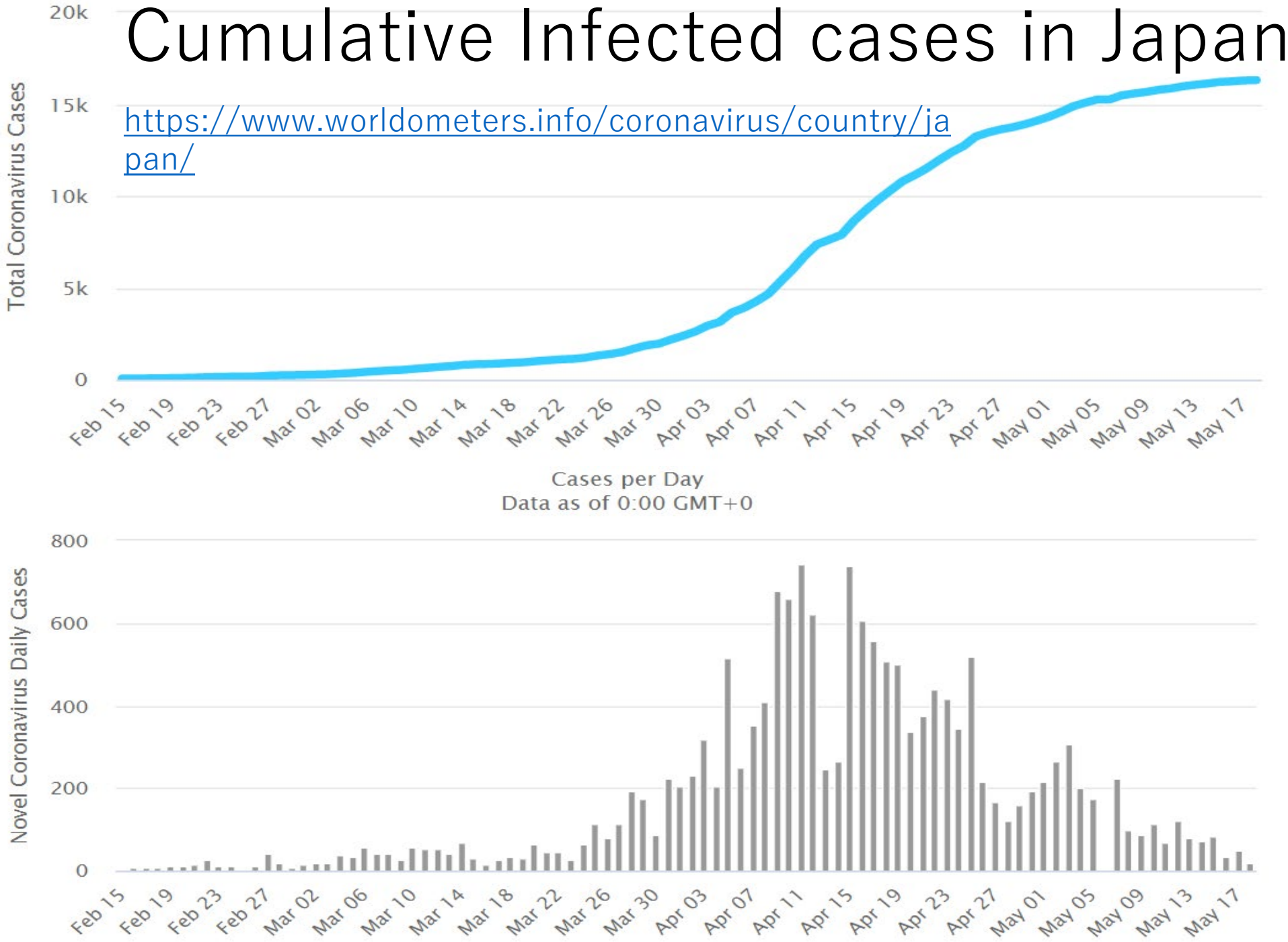


Content 3

Japan

Cumulative Infected cases in Japan

https://www.worldometers.info/coronavirus/country/japan/



General measures taken by the Japanese government (+ major events)

- January 16: The first infected case was confirmed in Japan.
- January 30: The Japanese government formally established a headquarter for dealing with the novel coronavirus. [Global deaths: 213]
- January 31: WHO announced that the novel coronavirus is a Public Health Emergency of International Concern. [Global deaths: 259]
- February 1: The first infection case was confirmed on the Diamond Princess cruise ship. [Global deaths: 304]
- February 11: WHO formally named the virus as COVID-19. [Global deaths: 1,115]
- February 13: The first death in Japan was confirmed. [Global deaths: 1,383]

Measures by the Japanese government

- February 25: A task force of cluster countermeasures was formally established by the Japanese government. This was also the start of the so-called Japan-specific countermeasures. Concretely speaking, instead of making a thorough check of the population, the Japanese government started to identify and target clusters of infection. [Global deaths: 2,763]
- February 28: The first declaration of a state of emergency in Japan was made by the governor of Hokkaido Prefecture. [Global deaths: 2,923]
- March 2: All elementary, secondary and high schools in Japan temporarily suspended until the spring break (April 6). [Global deaths: 3,117]

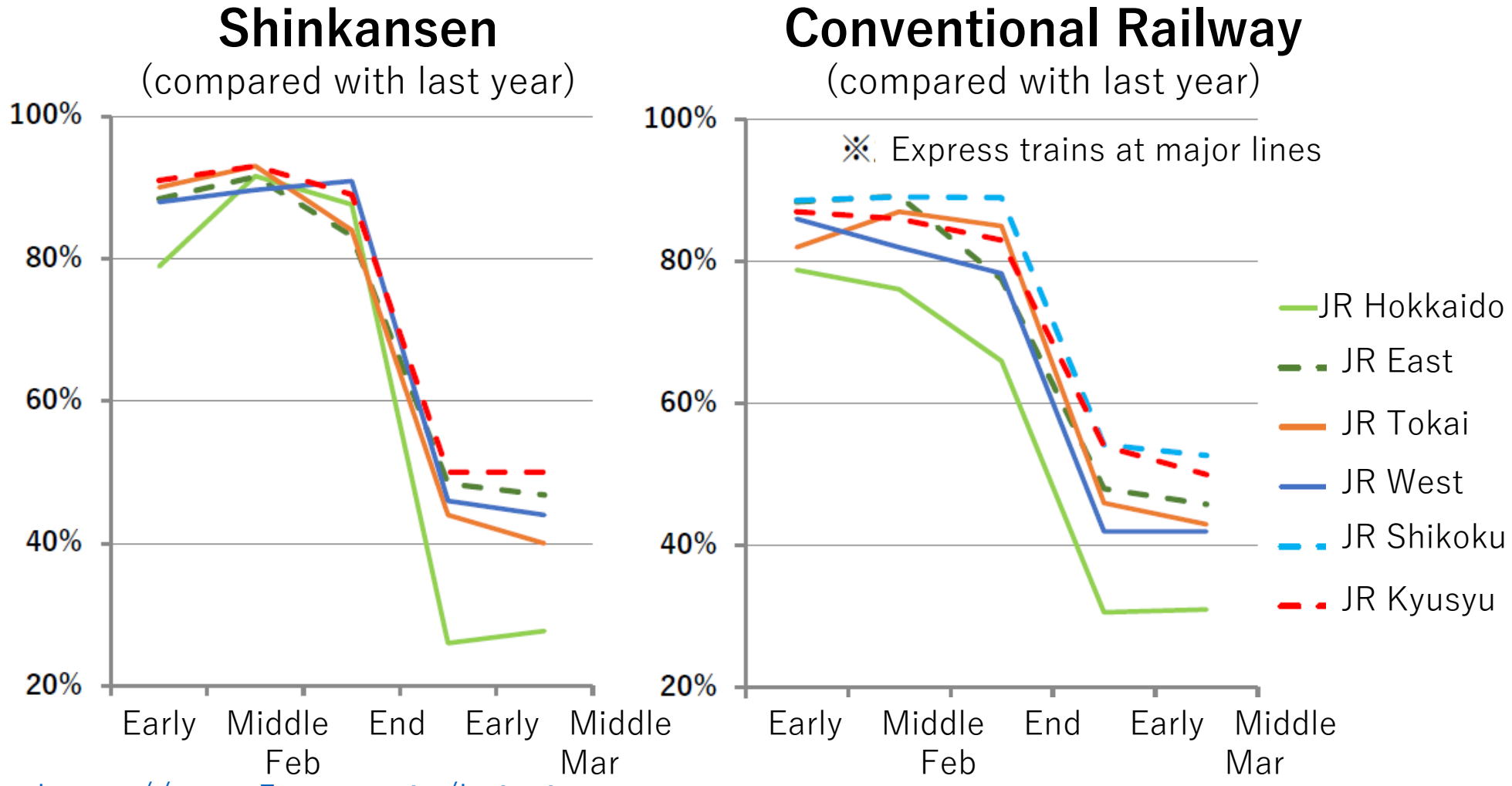
Measures by the Japanese government

- March 11: WHO announced that the COVID-19 outbreak is a pandemic. [Global deaths: 4,627; Total infection: 126,215]
- March 19: Recommendations of behavioral changes by a governmental task force were released in Japan. [Global deaths: 10,077]
- March 25: The Tokyo governor announced her requests for self-restraint on weekends. [Global deaths: 21,746]
- March 30: The Tokyo governor further announced her requests for self-restraint on both weekends and weekdays. [Global deaths: 39,334]

Measures by the Japanese government

- April 7: The central government declared a state of emergence at seven prefectures (until May 6).
- April 7: The central government announced an emergent economic budget of 108.2 trillion yen.
- April 16: The central government declared a state of emergence for the whole country (until May 6).
- May 4: The central government extended the emergence period to the end of may.
- May 14: The central government cancelled the emergence declaration for 39 prefectures.

Impacts of COVID-19 on railways in Japan: examples



https://www5.cao.go.jp/keizai-

Impacts of COVID-19 on railways in Japan: examples

Urban railways https://toyokeizai.net/articles/-/350639?page=2

- In March, Tokyo: -21.4% ～ -35.8% [commuter pass ≒ -50%]
- Effects of self-restraint requests (April):
  - Target: 70-80% reduction; Reality: -60% even during rush hours

During the Golden Week: declaration of a state of emergence https://www.bcnretail.com/market/detail/20200512_172995.html

- JR East, JR Tokai, JR West (Shinkansen + Express trains of conventional railways): - 90% or more [max: -97%] {in normal GW: very crowded}

Measures taken by the railway sector in Japan, in sequence

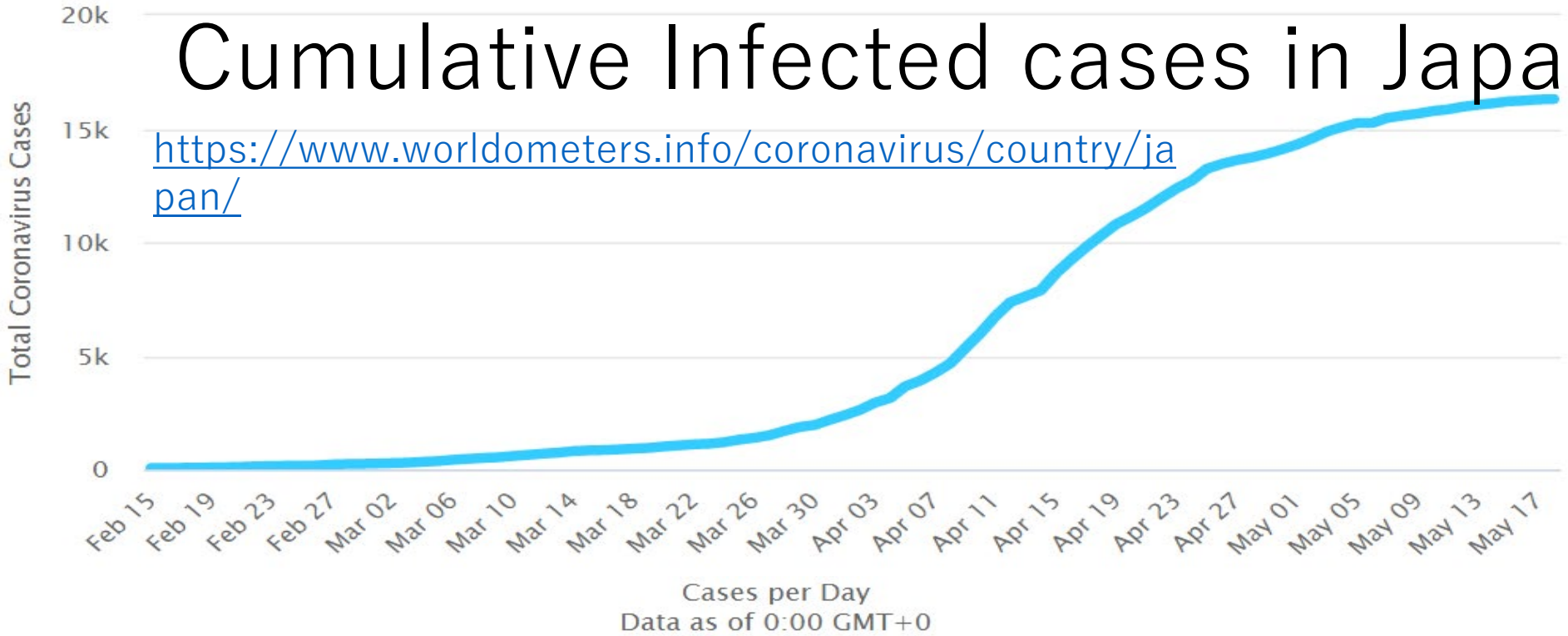
- Jan 30: Established a government response headquarter
- Jan 30: Established a government response headquarter at MLIT
- Jan 31, Feb 24: Measures for employees and users (masks, hand washing, installation of antiseptic solution); Requested prompt report of employee infection.
- Feb 12/14/24: Measures for users at railway stations (installation of antiseptic solution)
- Feb 24: Requests to railway users via announcement at stations and inside trains >>> Telework or staggered commuting
- Feb 24: Requests on strict health check of crew and station attendants

Measures taken by the railway sector in Japan, in sequence

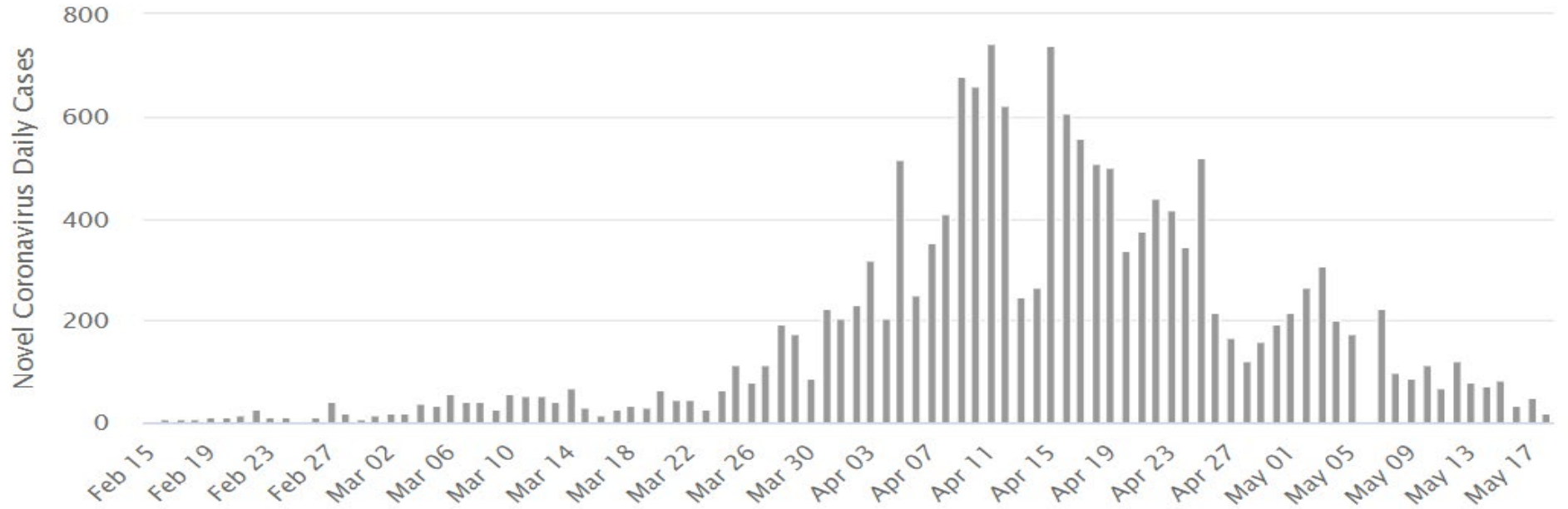
- Feb 26, Mar 31, Apr 9/12/17: Requests to railway operators >>> telework and staggered commuting
- Mar 12, May 5: Requests to users >>> ventilation, telework, cough etiquette
- Mar 16: announcement of financial support measures to railway operators
- Apr 14: Allow railway operators to postpone regular safety check due to the infection of employees
- Apr 3/17/27: Requests to the designated public transport operators >>> to continue the operation
- Apr 12/27: Social distancing measures at workplaces

Cumulative Infected cases in Japan

https://www.worldometers.info/coronavirus/country/japan/



Cases per Day
Data as of 0:00 GMT+0



Measures taken by the railway sector in Japan, in sequence

- Apr 17: Requests on the announcement at stations to users, about refraining from unnecessary and unurgent trips
- Apr 20: Requests on the cooperation with local municipalities who plan to implement enlightenment campaigns or check body temperature at stations
- Apr 23: Cable cars and ropeways should not be operated during the golden week
- Apr 27: Re-request about use of mask, hand washing for employees
- May 4: To publicize a guideline “About how railways should be operated against COVID-19 by MLIT”
- May 5: Self-restraint of inter-city trips

“About how railways should be operated against COVID-19”, by MLIT

May 4

- Railways are designated as the enterprises that must keep business operation for supporting people’s lives and national economy, by the central government.
- To meet the trip making needs from those who have to make trips (esp., medical staff); To take social distancing measures (avoid crowding)
- Importance of staff protection measures >>> In case of infection, operation frequency can be reduced or cancelled.
- Operation frequency can be reduced or cancelled, in the case of demand reduction caused by self-restraint.

Measures taken by the JR East, Based on Guidelines of Measures against COVID-19 for Rail Operators

From the JR East website

Main measures for users

対策	分　類	項　目	内　容
air-tight	換気の励行	車内換気	空調装置や窓開けによる車内換気を行っています。
Crowdedness	情報提供	混雑状況の緩和	JR東日本アプリにて、山手線車内や一部駅における混雑情報を提供しています。
		お客さまへの呼びかけ	駅構内放送や車内放送、デジタルサイネージ等を活用し、時差出勤やテレワーク等へのご協力の呼びかけを行っています。
Closeness			お客さまへマスク着用の呼びかけを行っています。
	座席指定	発売時の取扱い	シートマップを活用し、可能な限り間隔を空けて、座席を販売するよう取り組んでいます。
	飛沫感染防止	ビニールシート等の設置	改札等にビニールシート等を設置しています。
		お並び位置の明示	窓口等にお並びいただく際、間隔をとれるように足元に目安を明示しています。
Others	Dis-infection	消毒液の設置	改札口等に、アルコール消毒液を設置しています。
		駅・車両の清掃	駅の券売機や階段、エスカレーターの手すり及び車内のつり革等は消毒液を用いて、定期的に清掃しています。

Main measures for employees

項　目	内　容
Wear masks	全社員にマスク着用を指示しています。
Hand washing, gargling	石鹸を使用した手洗い、うがいを徹底しています。
Protect employees' health	出勤前に体調確認を実施しています。

Ventilation

Information Seat selection (混雑状況の緩和) map

Antiseptic solution

Prevention of splash infection

【ビニールシート等】　【お並び位置明示】

Guidelines for different modes/facilities, by MLIT

- https://www.mlit.go.jp/kikikanri/content/001344259

業種別ガイドラインについて

	業種	団体名	担当省庁名	ガイドライン掲載URL
1	インフラ運営	一般社団法人 建設電気技術協会	国土交通省	http://kendenkyo.or.jp/pdf/kendenkyo_guidelines.pdf
2		公益社団法人 日本下水道管路管理業協会	国土交通省	https://jascoma.com/index.html
3		一般社団法人 日本下水道施設管理業協会	国土交通省	https://www.gesui-kanrikyo.or.jp/contents/01-01news.html
4		東日本高速道路株式会社	国土交通省	https://www.e-nexco.co.jp/
5		中日本高速道路株式会社	国土交通省	https://www.c-nexco.co.jp/topics/1121.html
6		西日本高速道路株式会社	国土交通省	https://www.w-nexco.co.jp/
7		首都高速道路株式会社	国土交通省	https://www.shutoko.jp/inquiry/prevention/
8		阪神高速道路株式会社	国土交通省	https://www.hanshin-exp.co.jp/company/
9		本州四国連絡高速道路株式会社	国土交通省	https://www.jb-honshi.co.jp/
10		一般社団法人　日本埋立浚渫協会 一般社団法人　日本海上起重技術協会 一般社団法人　日本潜水協会 日本港湾空港建設協会連合会 全国浚渫業協会	国土交通省	https://www.umeshunkyo.or.jp/ https://www.kaikikyo.jp/ https://www.sensui.or.jp/ https://www.nikkoren.com/ https://www.zen-shun.com/
11	生活必需サービス	全国旅館ホテル生活衛生同業組合連合会 一般社団法人 日本旅館協会 一般社団法人 全日本シティホテル連盟	厚生労働省 国土交通省	http://www.ryokan.or.jp/top/news/detail/298 https://www.jcha.or.jp/news/283
12		一般社団法人 日本ホテル協会	国土交通省	https://www.j-hotel.or.jp/association/pressroom/association/6991
13	物流、運送	鉄道連絡会（一般社団法人 日本民営鉄道協会 ・ JR等）	国土交通省	https://www.mintetsu.or.jp/association/news/2020/15261.html
14		公益社団法人 日本バス協会	国土交通省	http://www.bus.or.jp/news/covid-19Guide.pdf
15		一般社団法人 全国ハイヤー・タクシー連合会	国土交通省	http://www.taxi-japan.or.jp/content/?p=article&c=311&a=13
16		一般社団法人 全国個人タクシー協会	国土交通省	http://www.taxi-japan.or.jp/content/?p=article&c=311&a=13
17		公益社団法人 全日本トラック協会	国土交通省	http://www.jta.or.jp/info/coronavirus_guideline.html
18		一般社団法人 日本港運協会	国土交通省	http://jhta.or.jp/docs/corona20200518.pdf
19		日本内航海運組合総連合会	国土交通省	http://www.naiko-kaiun.or.jp/
20		一般社団法人 日本旅客船協会	国土交通省	https://www.jpass.or.jp/news_detail.php?id=7554
21		一般社団法人日本船主協会	国土交通省	http://www.jsanet.or.jp/covid-19/index.html
22		一般社団法人 日本外航客船協会	国土交通省	http://www.jopa.or.jp/document/covid19-guidelines.pdf
23		日本船舶代理店協会	国土交通省	https://www.sendaikyo.org/
24		外航船舶代理店業協会	国土交通省	http://www.jafsa.jp/
25		定期航空協会 一般社団法人 全国空港ビル事業者協会	国土交通省	http://teikokyo.gr.jp/ http://www.air-terminal.or.jp/
26		一般社団法人 日本旅行業協会 一般社団法人 全国旅行業協会	国土交通省	https://www.jata-net.or.jp/virus/200514_crisisandcguideline.html
27		一般社団法人 日本倉庫協会	国土交通省	https://www.nissokyo.or.jp/index.php
28		一般社団法人 日本冷蔵倉庫協会	国土交通省	http://www.jarw.or.jp/
29		公益社団法人 全国通運連盟 一般社団法人 航空貨物運送協会 一般社団法人 国際フレイトフォワーダーズ協会 日本内航運送取扱業海運組合	国土交通省	http://www.t-renmei.or.jp/ http://www.jafa.or.jp/ https://www.jiffa.or.jp/
30		全国トラックターミナル協会	国土交通省	http://www.zentaikyo.jp/
31	製造業全般	一般社団法人 日本造船工業会	国土交通省	https://www.sajn.or.jp/
32		一般社団法人 日本中小型造船工業会	国土交通省	http://www.cajs.or.jp/03detail.html?id=1451

※上記のほか、学校、社会福祉施設、社会体育施設、研究施設等については所管省庁においてガイドライン等を作成・公表。

鉄軌道事業における新型コロナウイルス感染症対策に

関するガイドライン

第１版

Guidelines of Measures against COVID-19 for Rail Operators Version 1

Railway liaison meeting

鉄道連絡会

令和２年５月１４日
May 14, 2020

Social distancing and reduction of railway capacity (actual ridership) : in the case of pandemic flu (2011)

- Required reduction: 1m > -68%; 2m > -82%

If the absence ratio of staff is 40%

- Required reduction: 1m > -84%; 2m > -91%
- Experiment in 2011

② 実験の様子

（乗客相互 1m 間隔）

（乗客相互 2m 間隔）

2011 Survey by MLIT: https://www.mlit.go.jp/

Summary: railways

- Preparedness: for example,
  - ✓Action Plan for novel influenza (prepared by MLIT in 2008)
  - ✓Survey and Research on measures against novel influenza in Tokyo Metropolitan Area by MLIT in 2011
- During the COVID-19 pandemic
  - ✓Establish a headquarter in MLIT, following central gov.
  - ✓*PASS approach* [named by the speaker, not by MLIT]
    - Step 1: (**P**rotect) Measures for employees and users
    - Step 2: (**A**void) Telework
    - Step 3: (**S**hift) Staggered commuting
    - Step 4: (**S**top) Stop unnecessary and unurgent trips
- After the COVID-19 pandemic
  - ✓Financial measures for compensating losses and recovery
  - ✓"Go to Travel" campaign (cross-sectoral)
  - ✓Deregulation for new transport/logistics businesses (e.g., online order and food delivery, freight transport by taxi)
  - ✓Improvements of public transport for international tourists
  - ✓Large-scale promotion for inbound tourism
  - ✓Reform of supply chain
  - ✓Society 5.0

国土交通省
新型インフルエンザ対策
行動計画

Action Plan for Measures Against Novel Influenza

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国土交通省

1. Before the occurrence
2. During the occurrence in other countries
3. Early stages of the occurrence in Japan
4. During the pandemic in Japan
5. During the steady period of the pandemic

Content 4

Conclusion

New Normal in Transport

- Down sized equilibrium of sales and cost to maximize profit
- Peak-cut merits: less per hour demand intensity with lower cost for Infrastructure→ Do not be afraid of downsizing!
- Resilience(復元力)
  - Reversible Society, Redundancy of Infrastructure, Contingency Plan
- Transport small [not make unnecessary trips], Benefit large
- Not transport all at peak hours/seasons, but select passengers and freights.
- Clear policy of congestion charge & off-peak hour discount to realize non-congested transport and cities

What does COVID-19 suggest to Human Society?
How to live in Anthropocene ?

- Healthier life (QOL, GNH) as an outcome of social activity appreciated in 21st century rather than higher economic prosperity (Income, GDP) as an input to the life sought in 20th century
- Less income with less passengers but even less cost to maintain infrastructure by peak-cut→ seeking for *Higher net income and increased personal time*
- Resilient Society
  - Emergency adaptive life-work style
    - 20th century: Climate Emergency → Excessive Extreme Weather
    - 21st century : Future: Reversible Society → Infrastructure with Rooms and Redundance
- Never-coming chance to mindset for human beings

➢ Anthropocene: see Club of Rome 50th Anniversary Book *"Come On!"(Springer, 2018)*

<https://clubofrome.org/>