

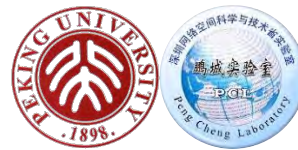
# COVID-19 in China & Open Science

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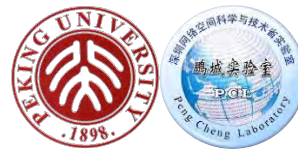


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# Content

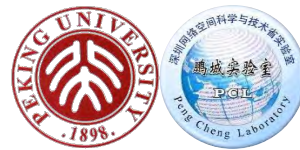
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- COVID-19 Happening in China
- COVID-19 Related Open Science in China
- COVID-19 Related Open Resources from China
- Summary

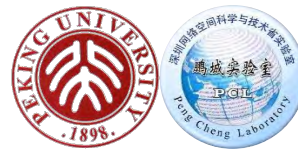
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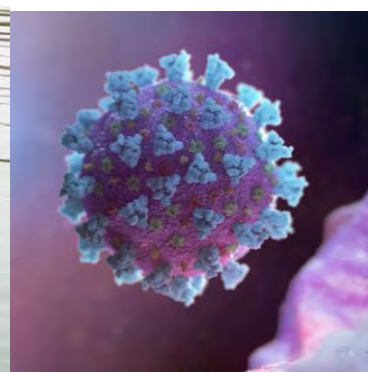
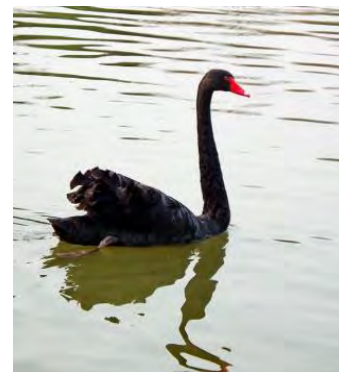
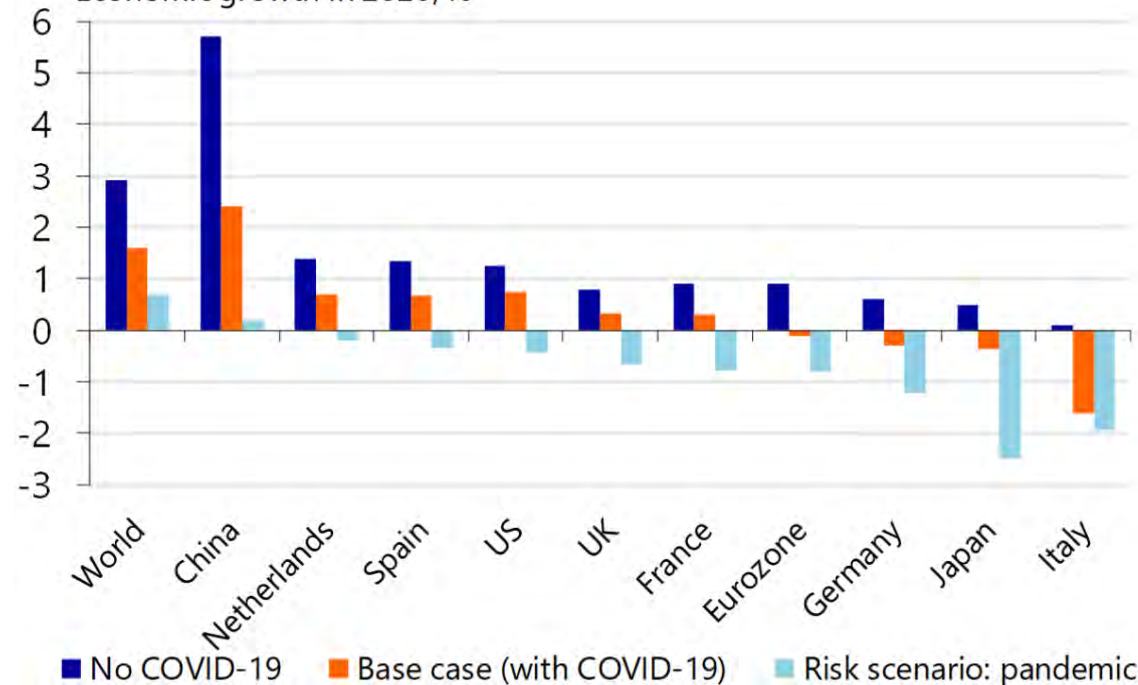
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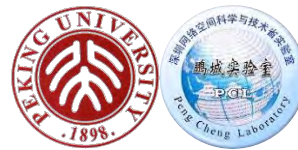
# COVID-19 Impact Globally



**COVID-19 is the biggest black swan in 2020!**

Economic growth in 2020, %





By 1<sup>st</sup> June, there have been 6,172,228 confirmed cases of COVID-19 globally, including 372,116 deaths.

THE LANCET  
Infectious Diseases

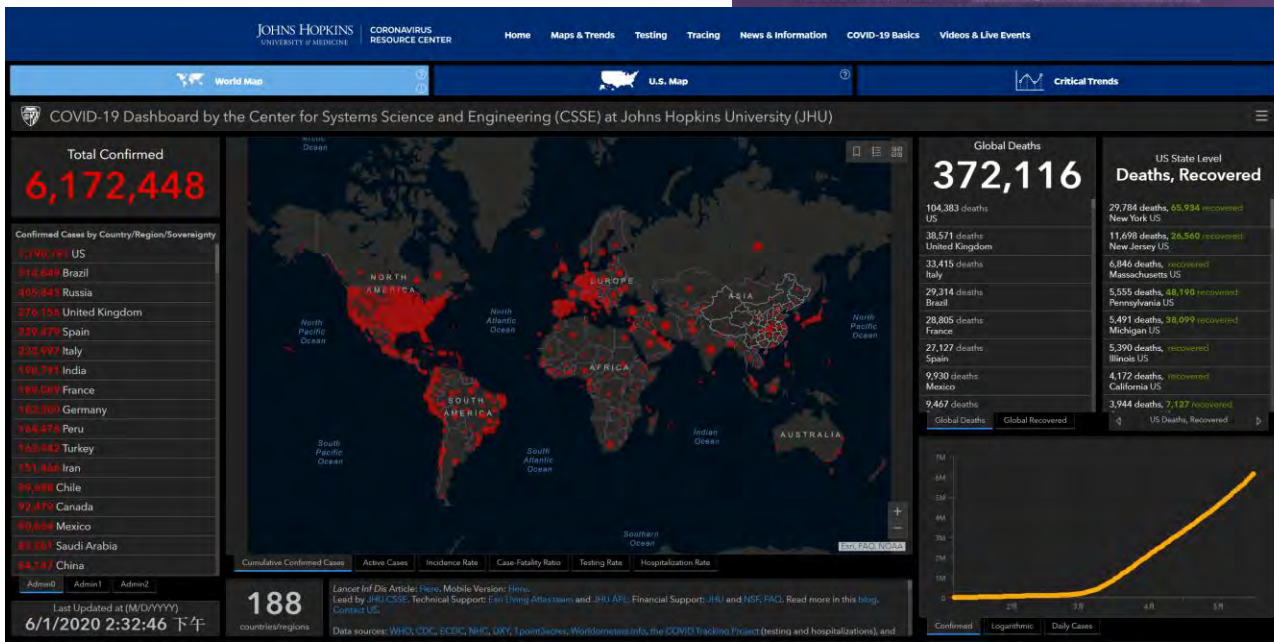
CORRESPONDENCE | VOLUME 20, ISSUE 5, P533-534, MAY 01, 2020

An interactive web-based dashboard to track COVID-19 in real time

Ensheng Dong · Hongru Du · Lauren Gardner Published: February 19, 2020 • DOI: [https://doi.org/10.1016/S1473-3099\(20\)30120-1](https://doi.org/10.1016/S1473-3099(20)30120-1)

*Data source from China:*

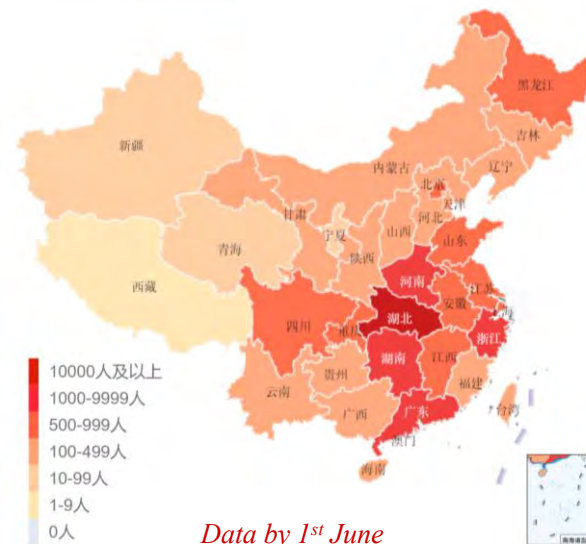
*China CDC, ministry's emergency office, Dingxiangyuan website*



cumulative confirmed cases: 84,590

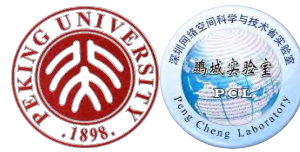
cumulative recovered cases: 79,822

cumulative deaths: 4,645



*Data by 1<sup>st</sup> June*

# The stage of anti COVID-19 in China



## □ COVID-19 history in China

- Stage I: Early outbreak in Wuhan City
- Stage II: Central government take action on fighting COVID-19
- Stage III: Prevention of community spread and importation
- Stage IV: Return to work and production, and school reopening

Dec 1<sup>st</sup>, 2019 ~ Jan 22<sup>nd</sup>, 2020



Jan 23<sup>rd</sup>, 2020 ~ Feb 25<sup>th</sup>, 2020

Feb 26<sup>th</sup>, 2020 ~ May 5<sup>th</sup>, 2020



May 6<sup>th</sup>, 2020 ~ ?

# The stage of anti COVID-19 in China

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- Stage I: Early outbreak in Wuhan, local government action slowly
  - December 1, first case received in hospital, but unknown virus
  - December 31, local governments launched "emergency response to pneumonia of unknown cause"
  - Emergency response by local CDC
    - January 08<sup>th</sup>, Detection and diagnosis of the first case, new coronavirus
    - January 13<sup>rd</sup>, Strengthen the screening management of fever clinic and establish a designated rescue hospital
    - January 16<sup>th</sup>, Launch joint prevention and control mechanism of major local infectious diseases
    - January 21<sup>st</sup>, Establish a centralized isolation area

# COVID-19 in Wuhan

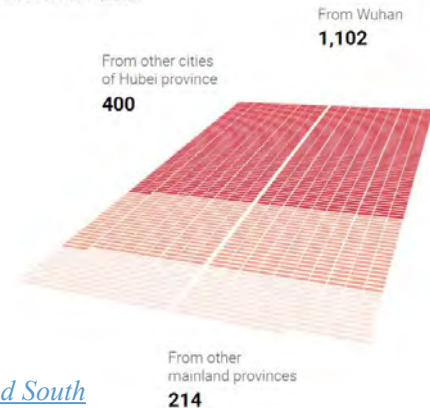
- Even not known where the original virus come from, the outbreak has been linked to Wuhan's Huanan Seafood Free Market
- Wuhan is an international and domestic hub, easy spread

## Where Coronavirus originated in Wuhan



## Number of infected medical workers in mainland China

Data as of Feb 14, 2020

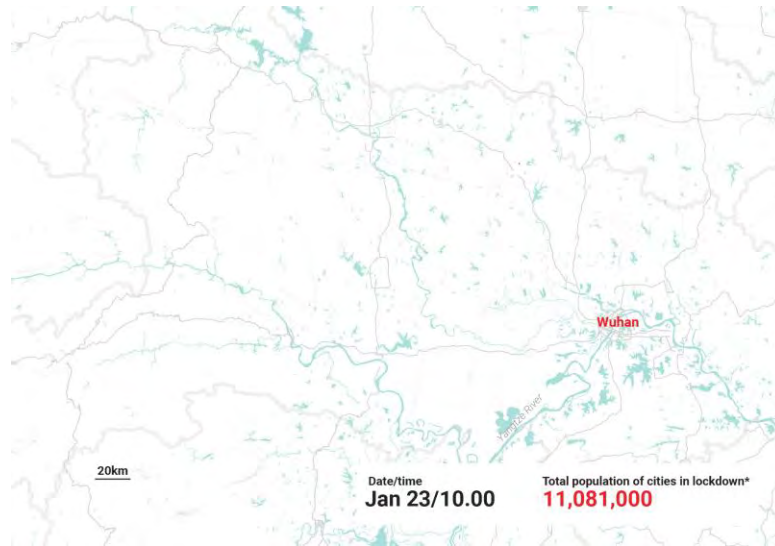


Source: [Municipal Health Commission and South China Morning Post](#)



## Top 10 international destinations from Wuhan December 30, 2019 to January 22, 2020

Airport	Seats
<b>Suvarnabhumi, Thailand</b>	<b>11,558</b>
Changi, Singapore	10,680
Narita, Japan	9,080
<b>Don Mueang, Thailand</b>	<b>9,000</b>
Hong Kong International Airport	7,078
Incheon, South Korea	6,430
Kansai, Japan	6,272
Macao International Airport	6,145
<b>Phuket, Thailand</b>	<b>6,116</b>
Kota Kinabalu, Malaysia	6,048



# COVID-19 in Wuhan

- After close, Wuhan has converted stadiums, convention centers and schools into **temporary hospitals**
- Two mobile cabin hospitals set up in two weeks.

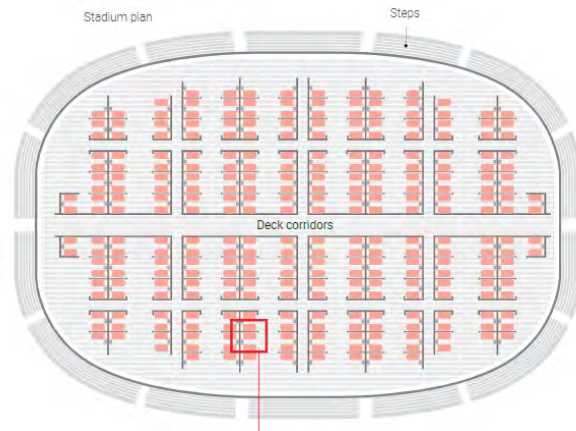
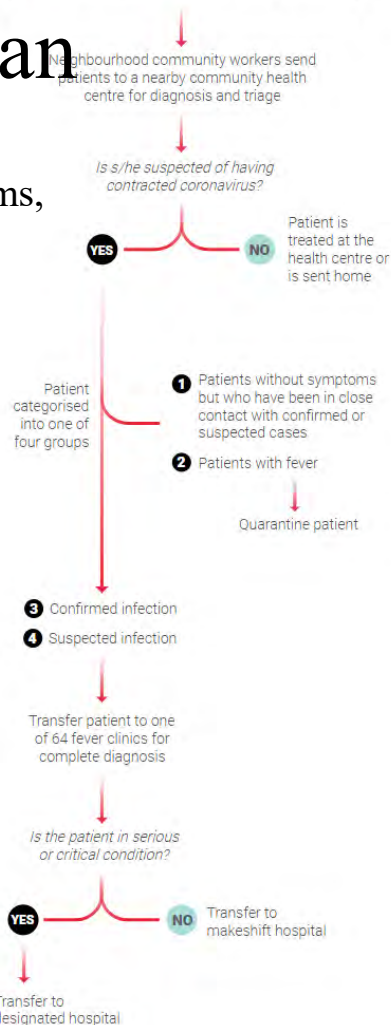


Data as of February 14, 2020

Source: [Municipal Health Commission and South China Morning Post](#)

So

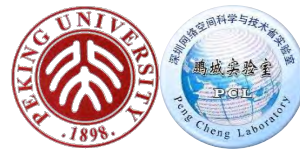
PATIENT HAS A FEVER OR FEELS UNWELL



Chinese experts shares experience with overseas experts on COVID-19 control

# COVID-19 in Wuhan

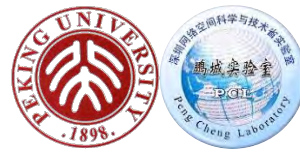
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- ☐ But, when we recheck the lockdown process, it would save more lives if the action started 2-3 weeks earlier
- ☐ People need time to understand unknown things, to learn lessons

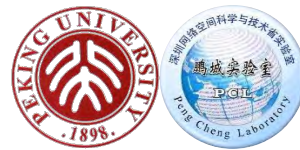
# The stage of anti COVID-19 in China

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- Stage II: Central government take action on fighting COVID-19
- The central government take action immediately once they got the report from CDC experts, close infectious area, and send medical teams from cities in safe area
  - January 23<sup>rd</sup>, Central government decides to close Wuhan city and Hubei province
  - January 23<sup>rd</sup>-February 2<sup>nd</sup>, Construct Huoshenshan mobile cabin hospital
  - January 23<sup>rd</sup>, Organizing medical teams nationwide to help Wuhan
  - Treatment of covid-19 with integrated traditional Chinese medicine and western medicine

# The stage of anti COVID-19 in China

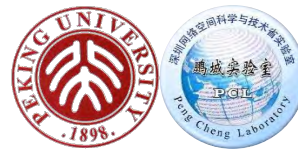


- Stage III: Prevention of community spread and importation
  - Once Wuhan outbreak get controlled, spread control become the key. In China, Provincial, municipal, district and residential area implement access control and temperature measurement
  - People travel from risky area asked to be isolated for 14 days
  - People from oversea asked for 14 days isolation before go back to society

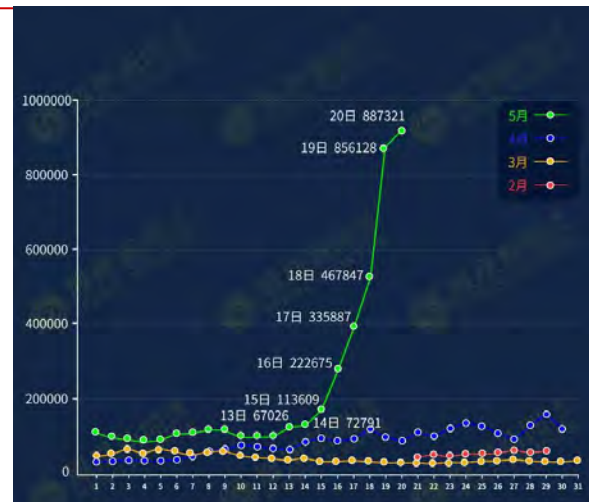


	STAY HOME: Advised to stay home due to mild cold symptoms, without known exposure to COVID-19.	SELF-QUARANTINE: An individual does not have symptoms, but may have been exposed to COVID-19.	HOME-ISOLATION: An individual has symptoms and has been exposed to COVID-19, is being evaluated for COVID-19, or has a confirmed case of COVID-19.
AFFECTED INDIVIDUAL	Stay home until all symptoms are gone. Call your doctor if symptoms worsen.	Stay home for 14 days. Monitor for symptoms. Call Public Health if you develop symptoms.	If the sick individual is isolated at home, separate from the rest of the household. The individual should remain in isolation for 14 days.
HOUSEHOLD MEMBERS	Those without symptoms may continue to leave the home as needed.	Do not leave the home for 14 days and do not allow visitors.	Remain in isolation at home for 14 days in a separate area from the sick individual. The designated caregiver should follow the precautions from Public Health.

# COVID-19 in Wuhan



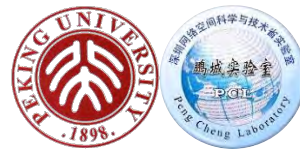
- ❑ Massive SARS-CoV-2 test plan in Wuhan done from May 14<sup>th</sup> to June 1<sup>st</sup>
- ❑ Free and voluntary for RT-PCR of nasal swabs
- ❑ **9,899,828 participants** have been involved and sampled by June 1<sup>st</sup>
- ❑ **300** asymptomatic cases were detected (**3.03/1000** positive ratio)
- ❑ **1,174** close contacts traced, tests shown **all negative**



Duration	Participants	Asymptomatic cases	Positive ratio (per 100, 000 people)
4/1 ~ 4/7	107,376	223	207.7
4/8 ~ 5/10	1,537,401	638	41.5
5/10 ~ 5/17	894,995	69	7.7
5.18 ~ 5.21	3,212,025	92	2.9

*Source: Wuhan Municipal Health Commission*

# The stage of anti COVID-19 in China



- Stage IV: : Return to work and production, and school reopening
  - February 24, China began to return to work by region orderly
  - School reopening since May 6<sup>th</sup>

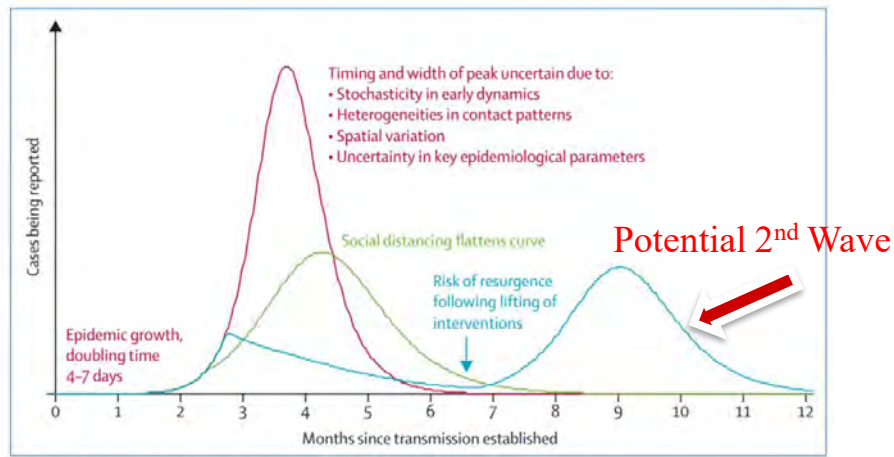


Figure: Illustrative simulations of a transmission model of COVID-19

*(Roy M Anderson, Lancet, 2020, 395)*

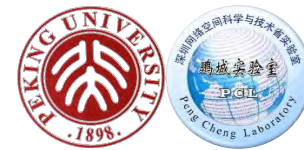


Zhong: “The disease is unlikely to be eradicated and will likely continue to spread over a longer period of time.”



Fauci: “I'm almost certain the second wave of coronavirus will come back.”

# Health Encyclopedia Code (HEC) for access control



## □ The continuous emergence of viruses:

### Recent zoonoses and their impacts

**MERS**(Middle East respiratory syndrome)**2,494 cases****858 deaths**

Since 2012

**SARS**(severe acute respiratory syndrome)**8,000+ cases****800+ deaths**

Since 2002

**EBOLA****28,000+ cases****11,000+ deaths**

2014-2015

**AVIAN FLU****US\$ 20 billion****in losses**

Since 2002

Source: UNEP Frontiers 2016 Report, WHO, World Bank

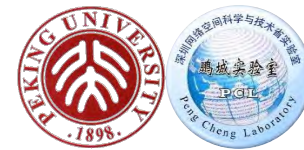
# COVID-19 RESPONSE



#COVID19

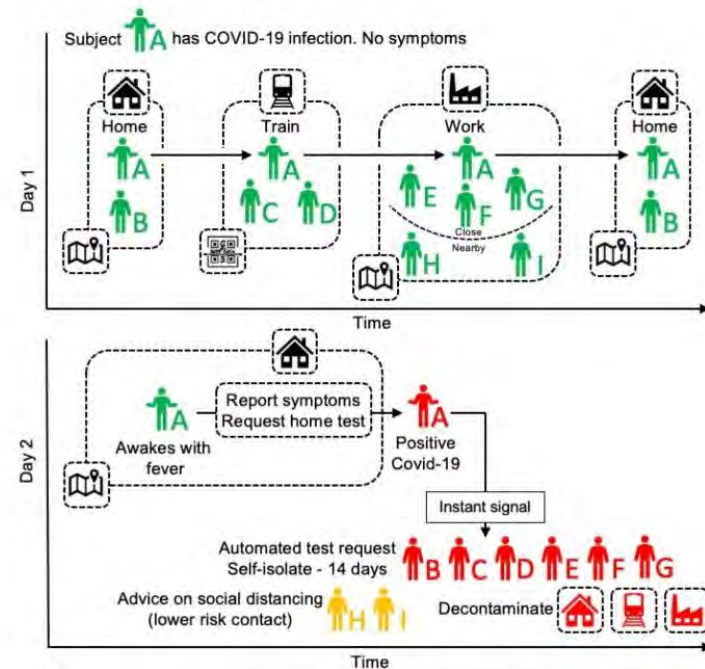
**UN**  
environment  
programme

# Content of HEC



## Health Encyclopedia Code (HEC) for epidemic prevention

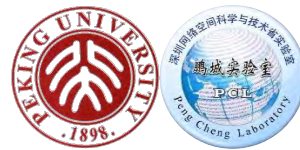
- The code can trace where you been in last 14 days
- The code can trace who you met in last 14 days



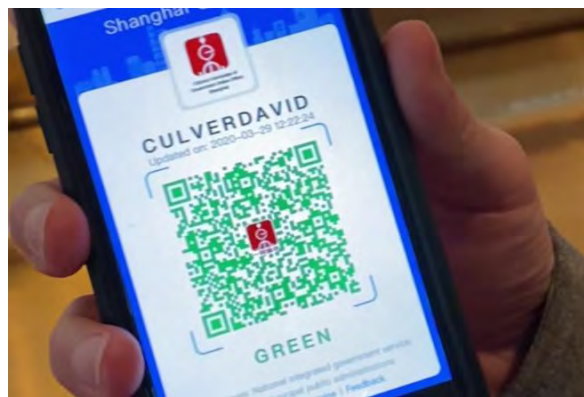
Contact tracing is essential to stop COVID-19 spreading in community

Active surveillance and isolation could reduce spreading speed

# Content of HEC



**China is fighting the coronavirus with HEC.**



HEC in Shanghai. A green HEC means healthy and safe.

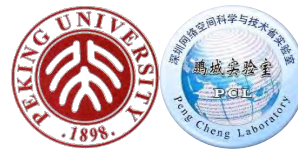


Passengers check their Wuhan HEC in Train Station on April 8.



A subway guard in Hangzhou checks HEC.

# Prevention and Control



## Health Encyclopedia Code (HEC) for epidemic prevention

- Shenzhen is the 1<sup>st</sup> city to apply HEC since 9<sup>th</sup> Feb
- Up to 24<sup>th</sup> Feb, 200+ major cities applied HEC in China



**Red code:** High exposure risk related to confirmed cases

**Yellow code:** Travel history in epidemic area in last 14 days

**Green code:** no exposure within recent 14 days



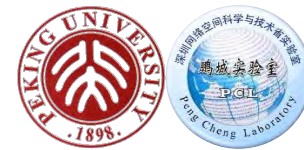
To enter an apartment, people must show 'green code' to safety guards in major cities of China.

THE LANCET  
Infectious Diseases



Scientific evidences show the active surveillance policy help reduce at least 40% COVID-19 cases in Shenzhen

# Prevention and Control



## More examples for Health Encyclopedia Code (HEC) for epidemic prevention

北京

湖北



天津

山东

福建

河北

广东

山西

上海

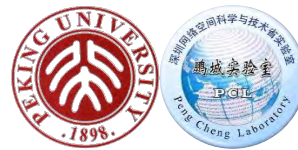
河北/沧州

云南/丽水

深圳



# Health Encyclopedia Code (HEC)



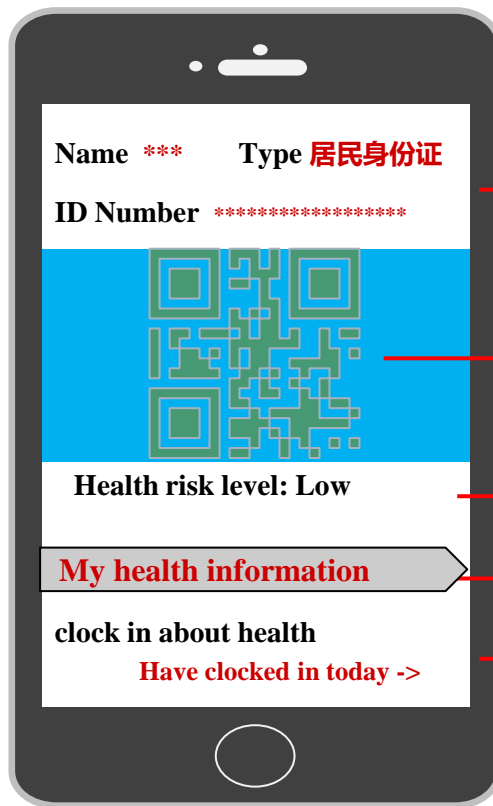
National standard (2020.4)

□ Containing:

- Infectious disease
- Chronic diseases
- Basic diseases
- Critical disease

□ Examples:

- COVID-19 sub-string
- Diabetes sub-string
- Cardio-cerebro-vascular diseases sub-string
- Body mass index sub-string



identity information

two-dimensional code

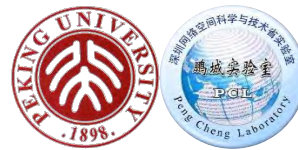
Notice

Health information self-check

Information declaration entrance

# Stage II - IV, very success

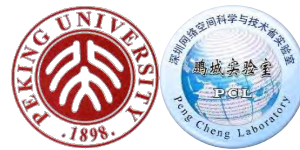
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- ☐ Mask, disinfect, keep social distance, physical exercise, ...
- ☐ Close Wuhan city and Hubei province
- ☐ Temperature detection by infrared equipment, access control by HEC, to all public buildings, living area, ...
- ☐ 14 days isolation from risky area

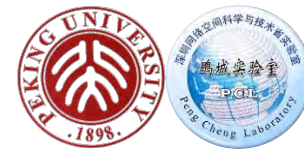
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# COVID-19 Research in Shenzhen



- ❑ Shenzhen faced a outbreak risk this spring.
- ❑ Epidemiological studies on locally index patients and close contacts are crucial.



*Source: Shenzhen municipal health commission*

**Daily cases over time in Shenzhen City**

