Diagnosis and Treatment of Acute Myocardial Infarction and Protection of Cardiologists in COVID-19 outbreak

Shanghai Tenth People's Hospital

Yi Zhang MD PhD FACC FESC

Yawei Xu MD PhD FACC FESC

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PANDEMIC

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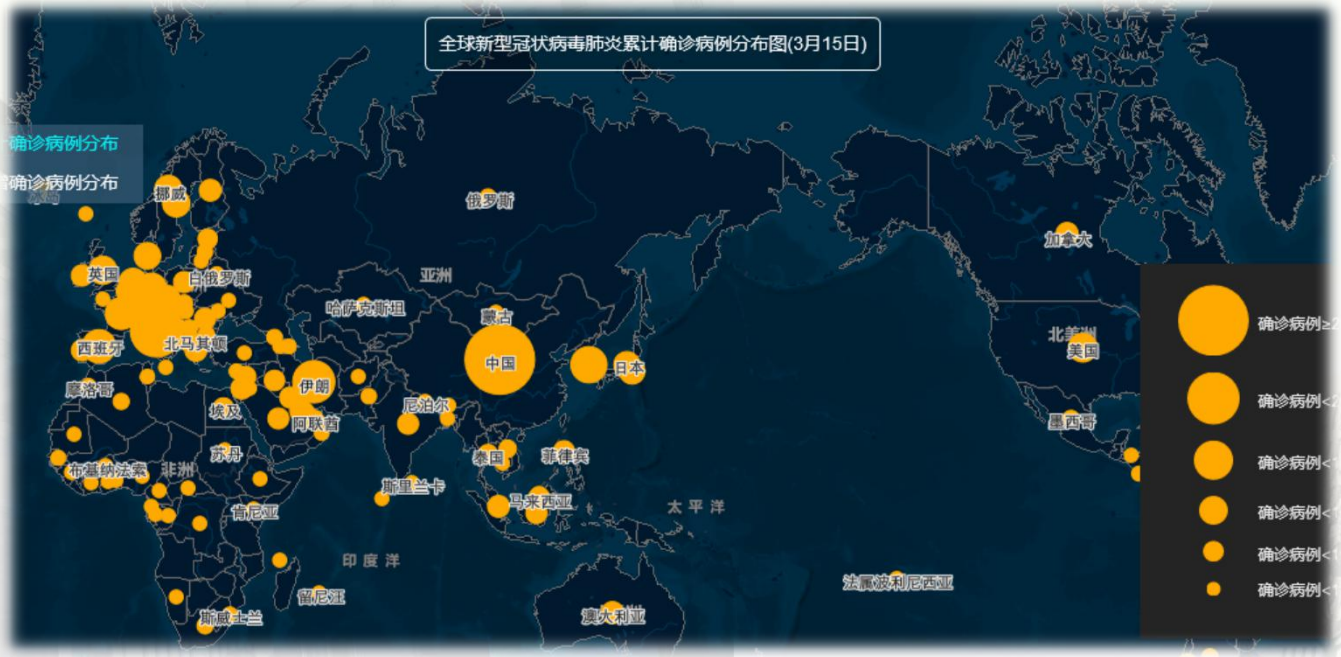
On Mar 13th, 2020
WHO Director-General said:

We have therefore made the assessment that COVID-19 can be characterized as a **pandemic**.

Till Mar 16th, 2020, more than **153,000** cases of COVID-19 have now been reported, from **146** countries and territories, with over **5,000** deaths



Rapid response in China

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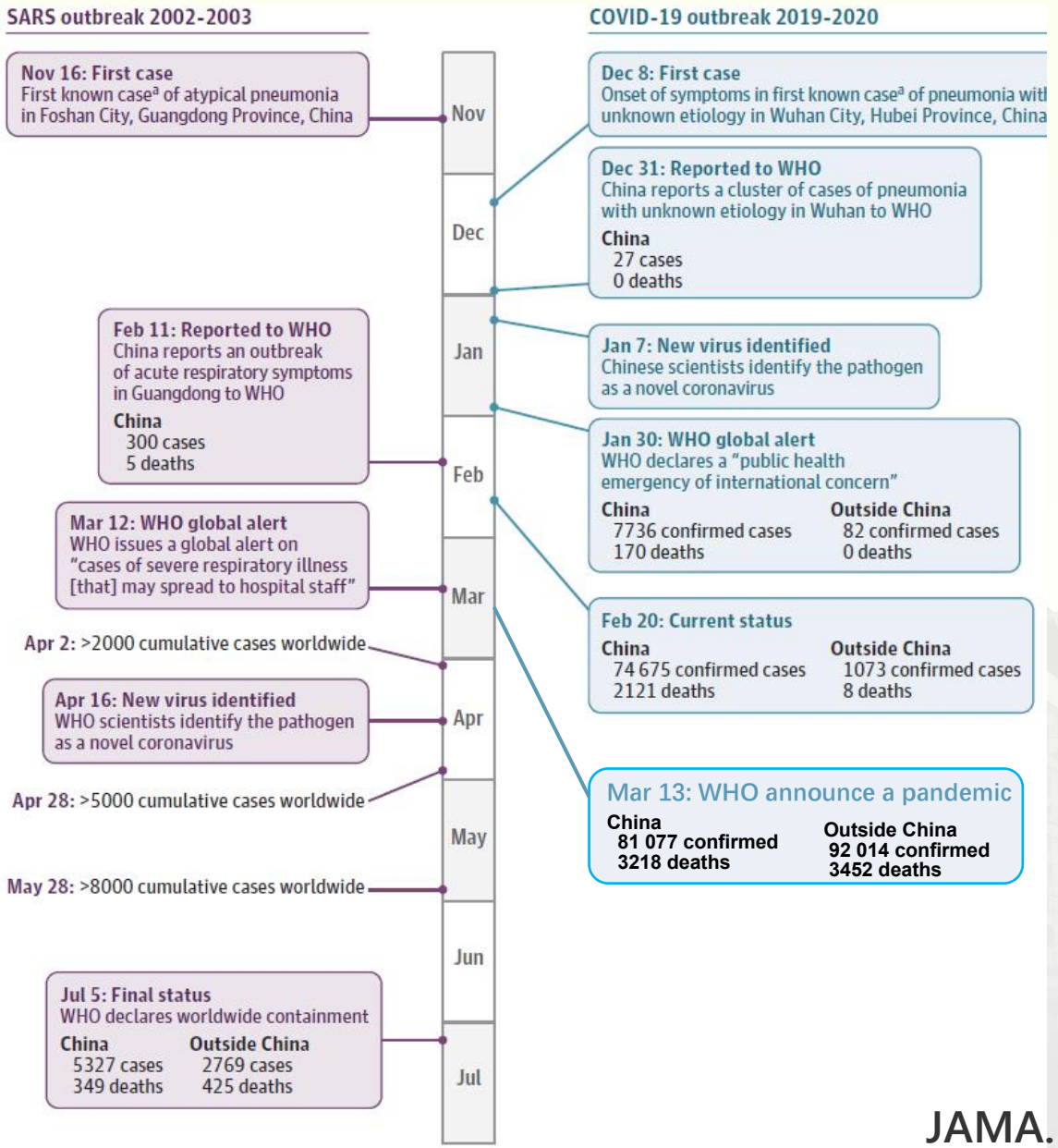

Box. Key Findings From the Chinese Center for Disease Control and Prevention Report

72 314 Cases (as of February 11, 2020)
- Confirmed cases: 44 672 (62%)
- Suspected cases: 16 186 (22%)
- Diagnosed cases: 10 567 (15%)
- Asymptomatic cases: 889 (1%)

Age distribution (N = 44 672)
- ≥80 years: 3% (1408 cases)
- 30-79 years: 87% (38 680 cases)
- 20-29 years: 8% (3619 cases)
- 10-19 years: 1% (549 cases)
- <10 years: 1% (416 cases)

Spectrum of disease (N = 44 415)
- Mild: 81% (36 160 cases)
- Severe: 14% (6168 cases)
- Critical: 5% (2087 cases)

Case-fatality rate
- 2.3% (1023 of 44 672 confirmed cases)
- 14.8% in patients aged ≥80 years (208 of 1408)
- 8.0% in patients aged 70-79 years (312 of 3918)
- 49.0% in critical cases (1023 of 2087)

Health care personnel infected
- 3.8% (1716 of 44 672)
- 63% in Wuhan (1080 of 1716)
- 14.8% cases classified as severe or critical (247 of 1668)
- 5 deaths

JAMA. Published online February 24, 2020. doi:10.1001/jama.2020.26

Infection in healthcare personnel

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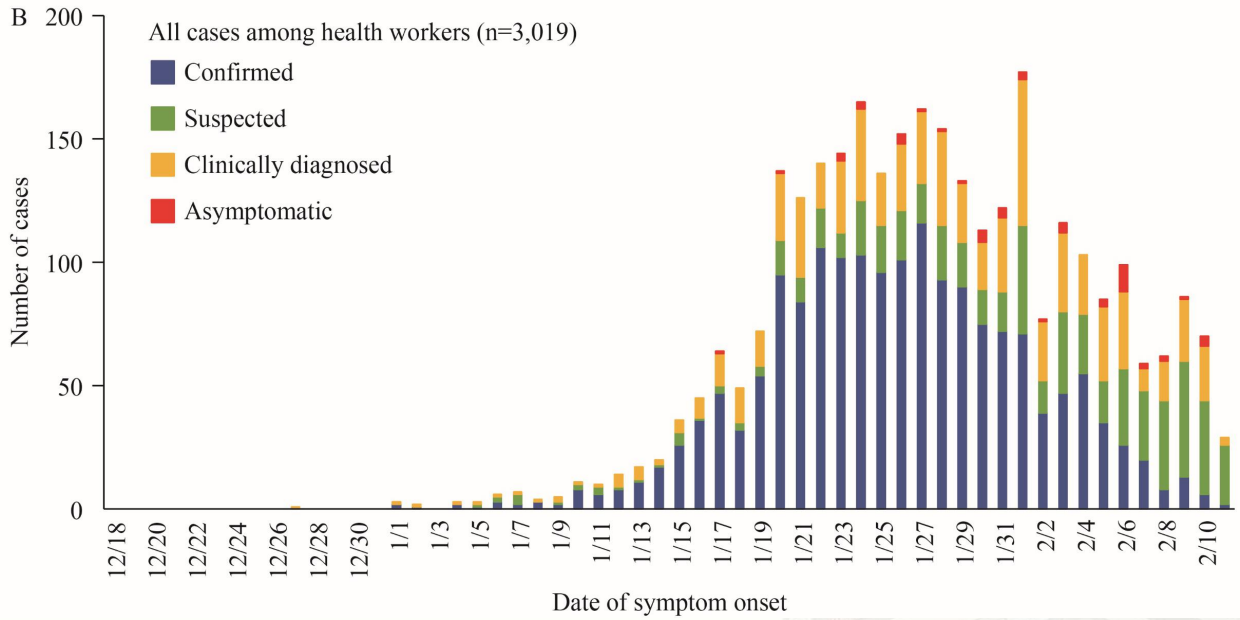

Health care personnel infected

- 3.8% (1716 of 44 672)
- 63% in Wuhan (1080 of 1716)
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Period (by date of onset)	Wuhan			China (overall)		
	Confirmed cases, N	Severe + critical, N (%)	Deaths, N (CFR*, %)	Confirmed cases, N	Severe + critical, N (%)	Deaths, N (CFR*, %)
Before Dec 31, 2019	0	0	0	0	0	0
Jan 1–10, 2020	18	7 (38.9)	1 (5.6)	20	9 (45.0)	1 (5.0)
Jan 11–20, 2020	233	52 (22.3)	1 (0.4)	310	61 (19.7)	1 (0.3)
Jan 21–31, 2020	656	110 (16.8)	0	1,036	149 (14.4)	2 (0.2)
After Feb 1, 2020	173	22 (12.7)	1 (0.6)	322	28 (8.7)	1 (0.3)
Total	1,080	191 (17.7)	3 (0.3)	1,688	247 (14.6)	5 (0.3)

China CDC Weekly. Accessed February 20, 2020.

Updated guidelines and consensus

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- 2020.01.21 — Diagnosis and treatment of COVID-19 (1st edition)
- 2020.01.22 — Diagnosis and treatment of COVID-19 (2nd edition)
- 2020.01.23 — Diagnosis and treatment of COVID-19 (3rd edition)
- 2020.01.27 — Diagnosis and treatment of COVID-19 (4th edition)
- 2020.02.05 — Diagnosis and treatment of COVID-19 (5th edition)
- 2020.02.08 — Diagnosis and treatment of COVID-19 (5th edition modified)
- 2020.02.19 — Diagnosis and treatment of COVID-19 (6th edition)
- 2020.03.03 — Diagnosis and treatment of COVID-19 (7th edition)

2020.01.30 — The **protection** strategy of cardiologist under the background of COVID-19 outbreak

2020.02.04 — Diagnosis and treatment process of **acute myocardial infarction** in the prevention and control of new coronavirus (COVID-19) Chinese experts consensus (1st edition)

2020.02.10 — Expert Consensus on Normalization of **Chest Pain Center** During COVID-19 Epidemic

2020.02.17 — Expert advice | Emergency management of **percutaneous coronary intervention** for patients with suspected COVID-19 (1st edition)

2020.02.21 — Chinese Expert Consensus on the Use of **ECMO** in Cardiovascular Critical Severe Severity in the Background of COVID-19 outbreak

COVID-19 in China is under control

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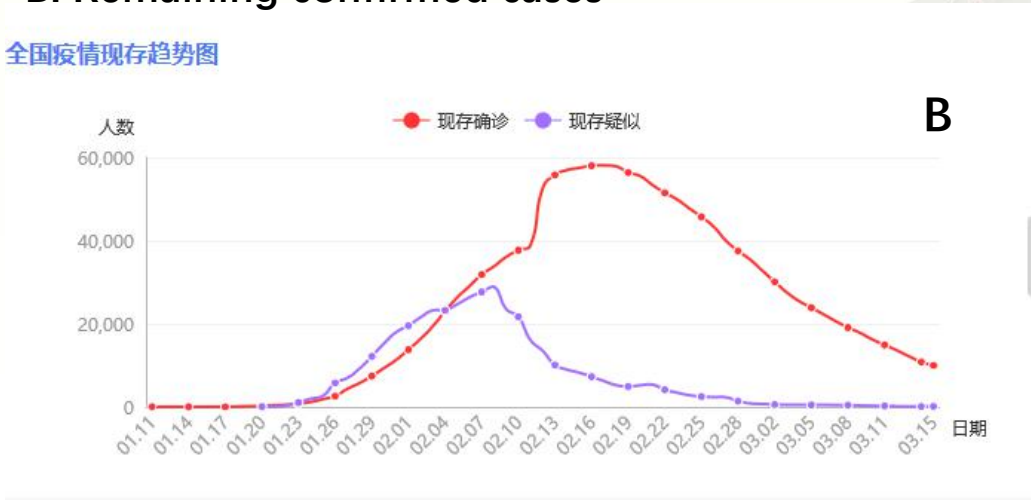
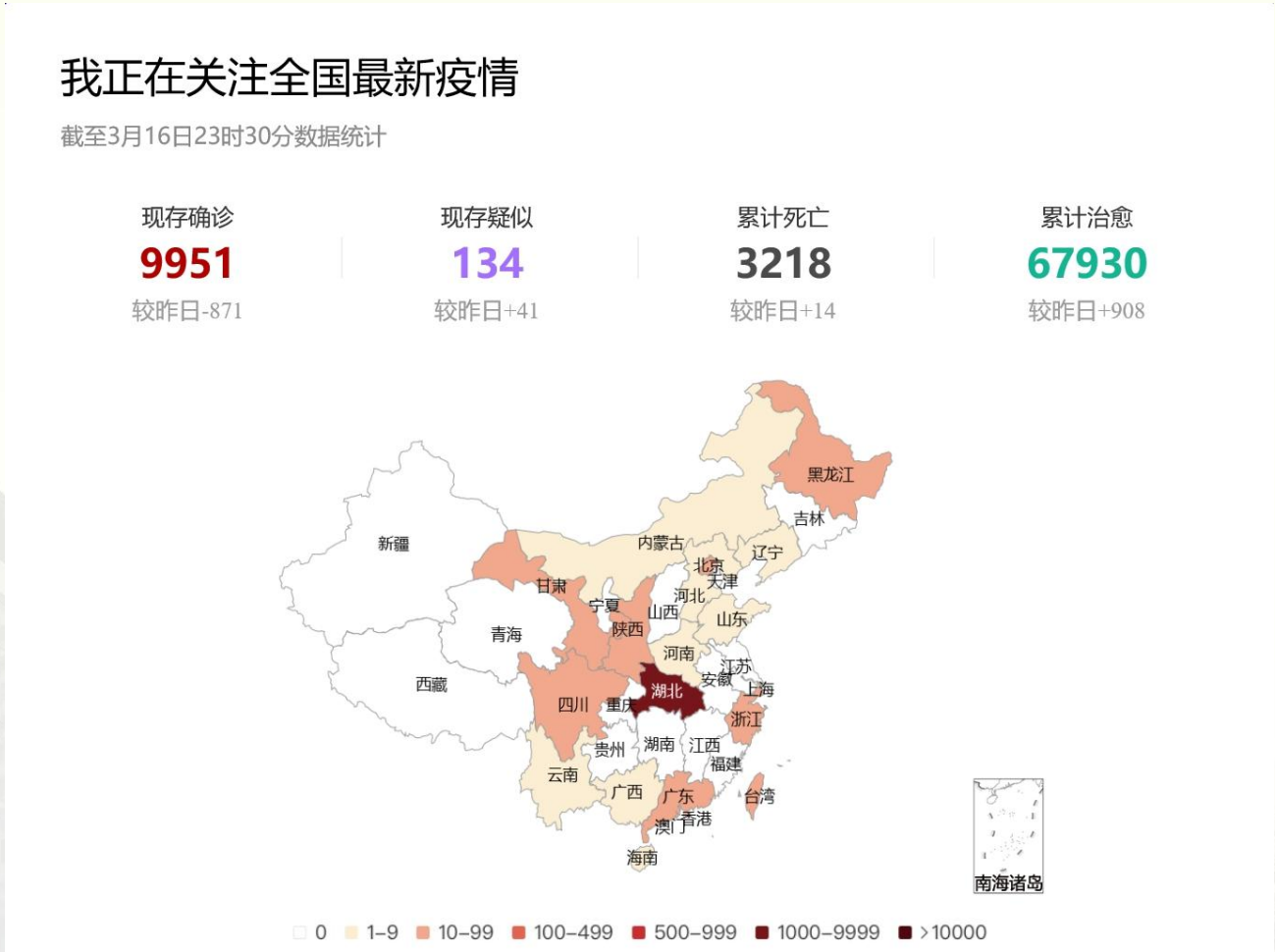
A. Newly-confirmed cases

B. Remaining confirmed cases





https://news.sina.cn/zt_d/yiqing0121

COVID-19 spread widely in the world

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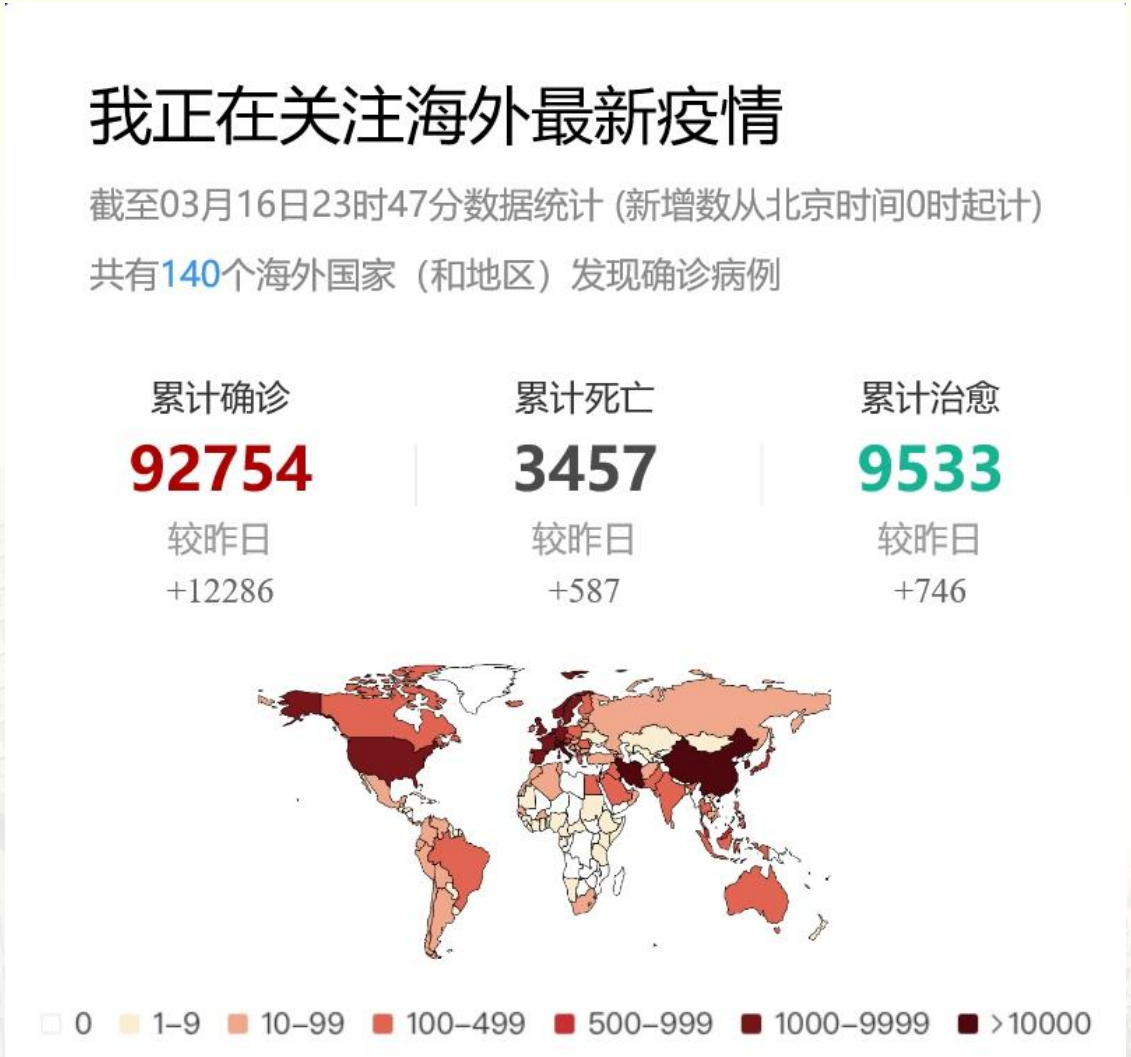

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Experience from China

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Diagnosis and Treatment of Acute Myocardial Infarction in COVID-19 outbreak

Protection of Cardiologists in COVID-19 outbreak

Experience from China

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Diagnosis and Treatment of Acute Myocardial Infarction in COVID-19 outbreak

General principles

◆ **Nearby treatment**

Encourage AMI patients to seek and receive medical treatment at the nearest medical institution, minimizing patient transfer

◆ **Safe protection**

AMI patients with fever and other respiratory symptoms should have their first consultation at the fever clinic

◆ **Thrombolysis first**

In the case of suspected or confirmed COVID-19 infection, patients with STEMI should be admitted to an isolation room. Thrombolysis should be performed for those without contraindications

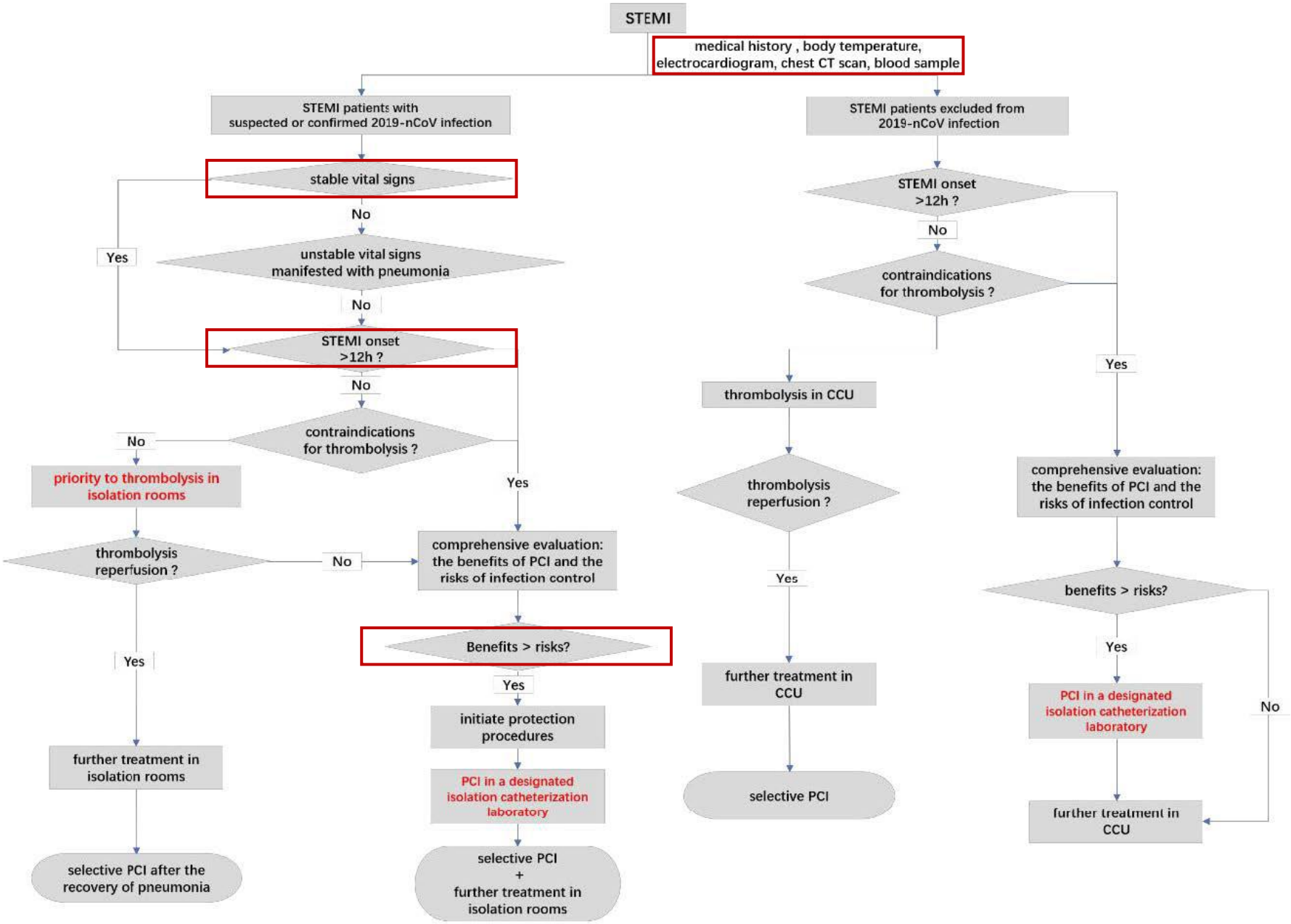
◆ **Designated transfer**

If the pathogenic test is positive for COVID-19, AMI patients with severe respiratory symptoms should be transferred to designated hospital

◆ **Remote consultation**

Encourage cardiologist to do remote medical consultations and guide the treatment of AMI in inferior hospitals

Flow chart of diagnosis and treatment for STEMI patients



Summary

- Follow the 5 general principles in the treatment of AMI
- Strictly assessment of STEMI patients
- For STEMI patients, different treatment strategies should be selected based on ① the possibility of COVID-19 infection ② the time window of STEMI onset ③ the vital signs are stable or not ④ weighting the benefit and risk;
- For NSTEMI patients, the treatment strategies should be selected according to ① the possibility of COVID-19 infection ② risk stratification (GRACE score)
- Strictly assess the contraindications and indications of thrombolysis
- Self-protection is always of great importance

Protection of Cardiologists in COVID-19 outbreak

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General principles

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◆ House Quarantine: Avoid unnecessary hospitalization

For patients with stable cardiovascular disease, **stay at home**, avoid hospitalization

◆ Confirmed patients: Isolation in situ

For patients diagnosed as COVID-19 and severe cardiovascular disease, they should be **isolated in situ**, and the hospital administration should organize a cardiologist consultation to make a treatment plan

◆ Suspected patients: Designated hospital with designated operation room and ward

For patients with suspected COVID-19 and acute cardiovascular disease, they should be transferred **to a designated hospital with designated catheterization lab**

◆ Patients with fever: Consultation

For patients suffered from severe cardiovascular disease and fever, **in-hospital expert consultation** should be initiated with chest CT and routine blood test

◆ Intervention: Operation consent

For patients with suspected/confirmed COVID-19 infection requiring intervention/surgical treatment, the operation consent should be signed by a family member **who has no history of close contact with him**

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Outpatient prevention and control management

Cardiologists in opt

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- Cardiologists should wear white coats, paper caps and surgical masks (PPE)
- strictly perform hand hygiene in outpatient clinic (before/after patient contact)

Patients in opt

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- Check body temperature and respiratory symptom
- For patients with fever or respiratory symptoms, they should be transferred to the fever clinic
- Patients who are highly suspected of COVID-19 infection should be immediately reported

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Ward prevention and control management

Ward report system

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Daily report system for patients with fever

- （1）the number of fever patients in the ward
- （2）the number of newly fever patients and the cause for fever
- （3）the number of fever patients whose cause remain unclear
- （4）the number of deaths and critical fever patient

防控期病区通报表（2020年3月3日8:00-3月4日8:00）

序号	病区	发热人数	肺部感染人数	新增发热人数	新增发热原因	住院发热患者诊断不明确人数	发热患者危重人数	发热患者死亡人数
1	妇产科	5	0	4	术后发热3人、产钳术后发热1人	0	0	0
2	SICU	0	0	0	/	0	0	0

Ward access management system

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- For everyone entering the ward, body temperature should be measured with registration
- It is recommended that only one relative can visit one patient, with no more than half an hour

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Consultation management for patients in fever clinic

Specials in fever clinic

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- Fever clinic was useful during SARS outbreak, and normally is set at the entrance. Patients with fever or respiratory syndrome are set for fever clinic, check routine blood test, assess contact and travel history, and chest CT scan
- If the cardiovascular disease has priority, remote consultant from cardiologists is recommended. Otherwise, cardiologists should be well protected with PPE
- If an urgent surgery or intervention is needed, cardiologists should report the case to the infection control department and medical affairs department
- If the patient is excluded for COVID-19, transfer them to the outpatients or emergency

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Prevention and control management of patients undergoing emergency interventional therapy

Patient transfer

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Four designations

Patients are accompanied by a **designated** cardiologist walking through a **designated** passage, using a **designated** elevator to a **designated** cath lab

Identification（身份信息）	**Patient's ID number, name, age, gender**
Situation（情境）	**Patient's main complaint, diagnosis, temperature, respiratory symptom and the treatment**
Background（背景）	**Patient's history of chronic disease**
Assessment（评估）	**Patient's routine blood test and chest CT scan**
Recommendation（建议）	**The further treatment recommendation**

Personal Protection Equipment

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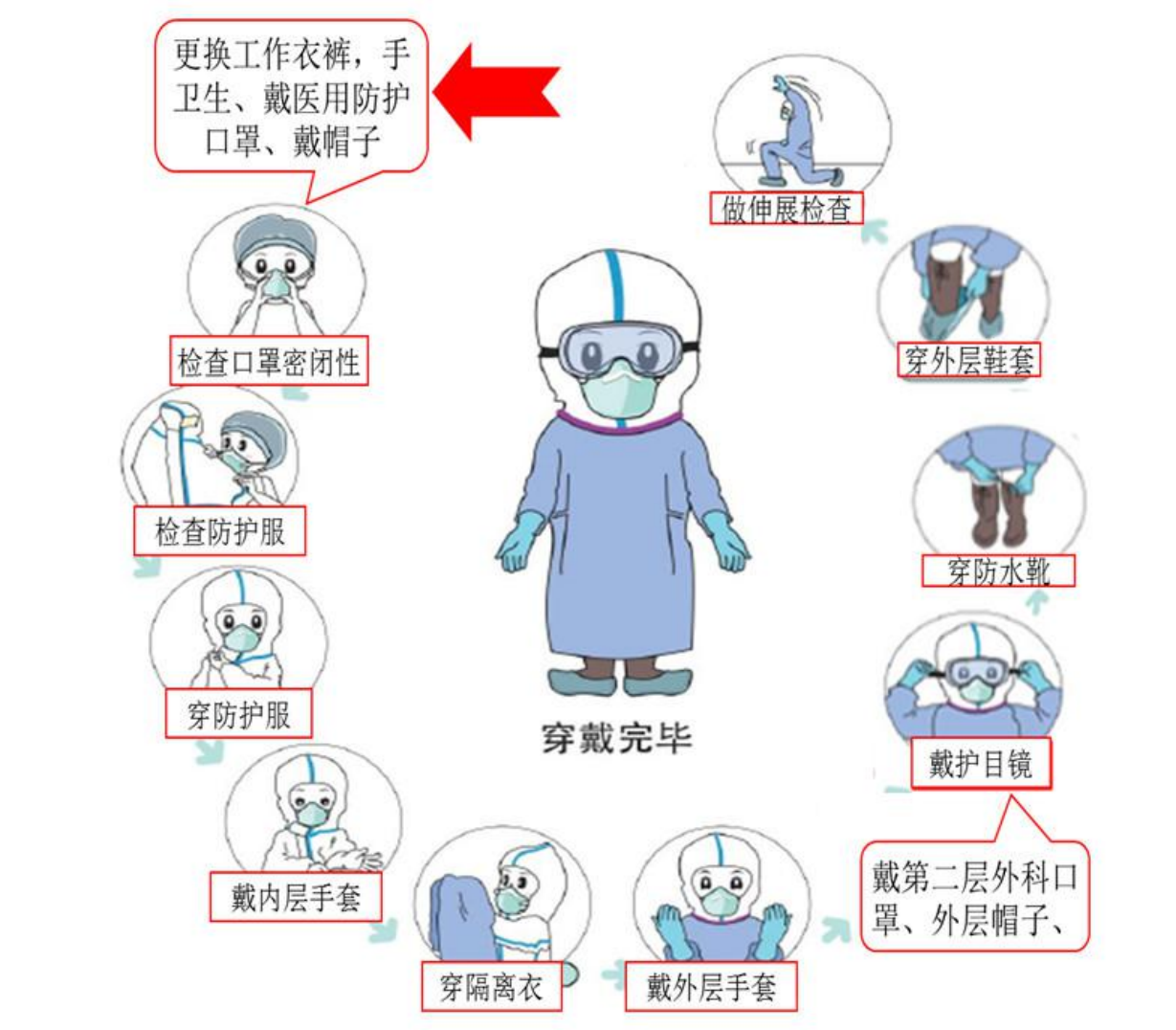
- Integrated protective clothing
- goggles (protective face screen or protective hood)
- Infrared thermometer, N95 masks
- disposable shoe covers (long style recommended)
- sterile instrument sets
- air sterilizers
- disposable sheets, etc.



Summary

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- Personal protection for health workers and patient management process are critical
- Many patients with severe cardiovascular diseases are critically ill, and there are many invasive operations for cardiologists. Herein, SOP is strongly recommended, as well as standard protection process
- Strengthen international cooperation, share experiences and data, and optimize diagnosis and treatment processes for patients with cardiovascular diseases

With all our will, we will surely win the final victory!

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Thanks for your attention!