

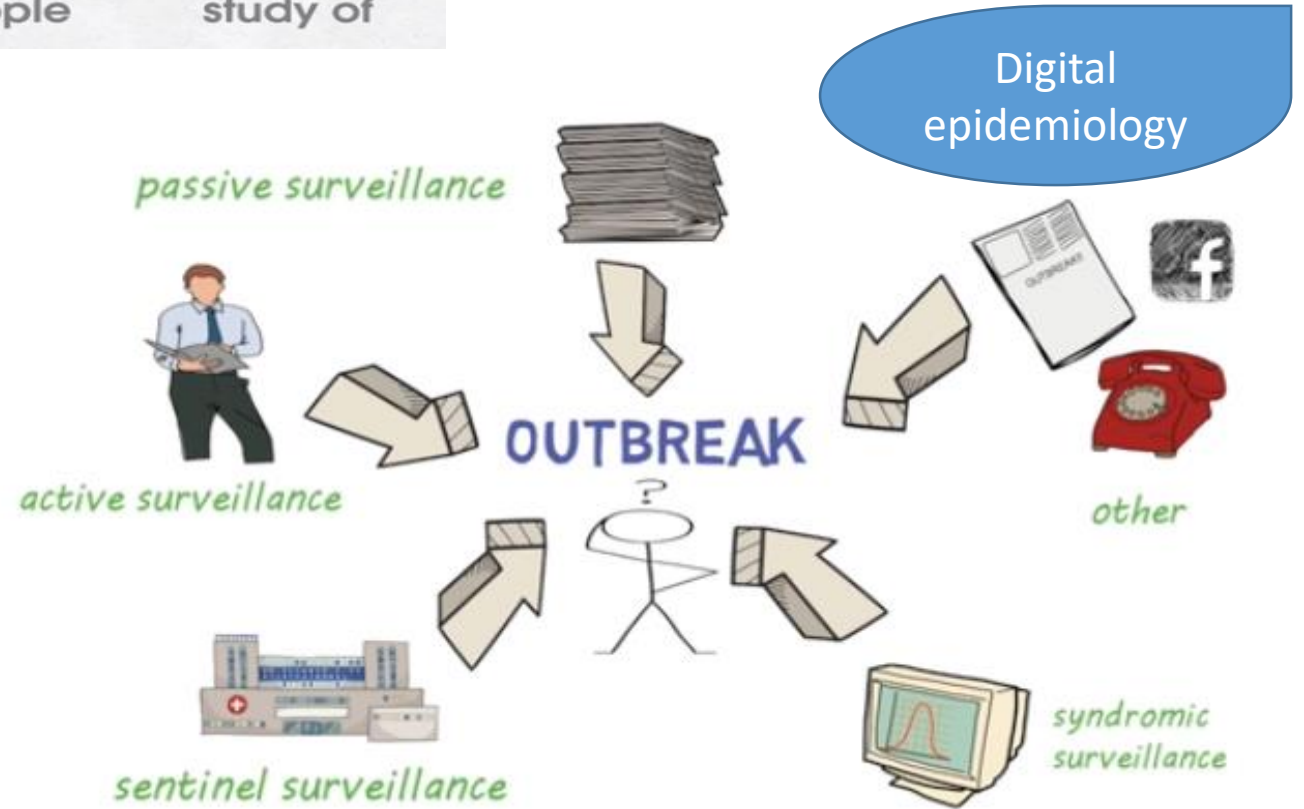
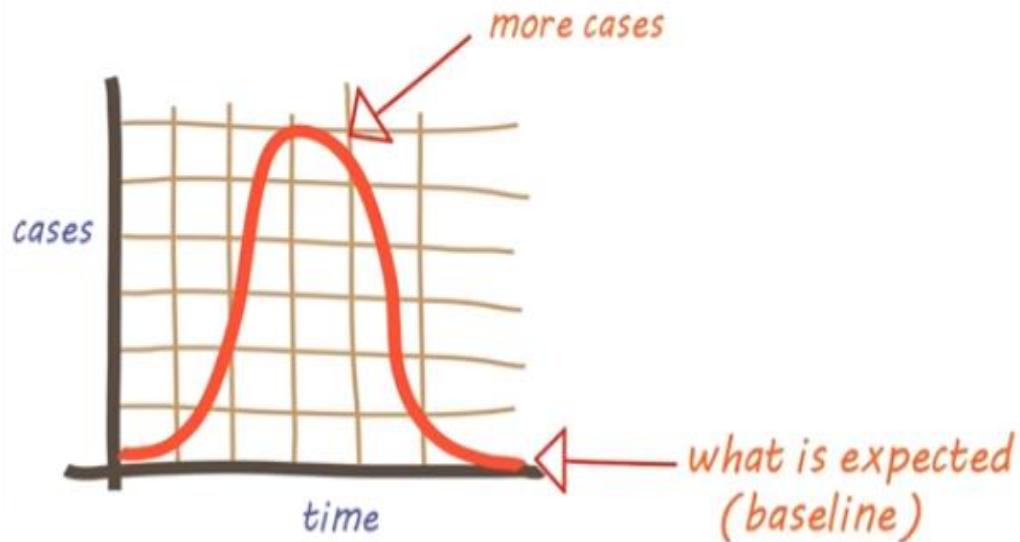
Epidemic **investigation** and **control** Epidemic **Curve** for COVID-19

بازخوانی و مروری بر روش های کنترل اپیدمی
کووید ۱۹ و نقش کمیته اپیدمیولوژی
آسیب شناسی نظام مراقبت اپیدمیولوژیک

Epidemic investigation and control

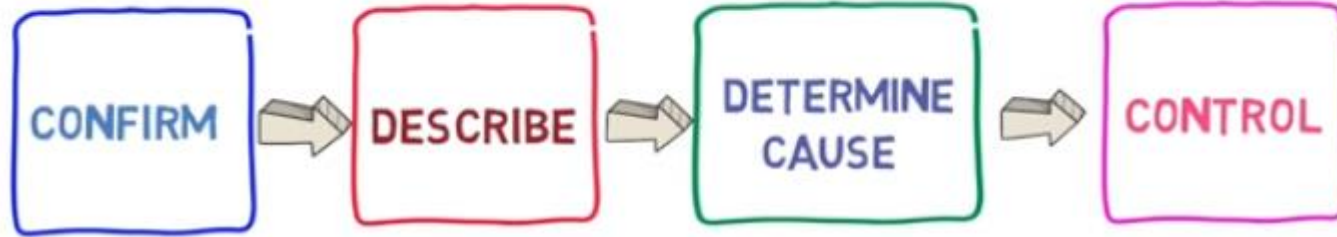
epi • *demi* • *ology*
on or upon people study of

WHAT IS AN OUTBREAK? → epidemic



OUTBREAK INVESTIGATION

systematic steps number, order, content can vary



CONFIRM

Is there an outbreak?



*Baseline level of disease
compare*



*Other cause?
increased testing?
lab error?
increase in population?*

verify diagnosis

- clinical*
- lab*

CONTROL

investigation team

DESCRIBE

who is a case?

case definition

- time*
- place*
- person*
- clinical*
- lab*

all cases found?

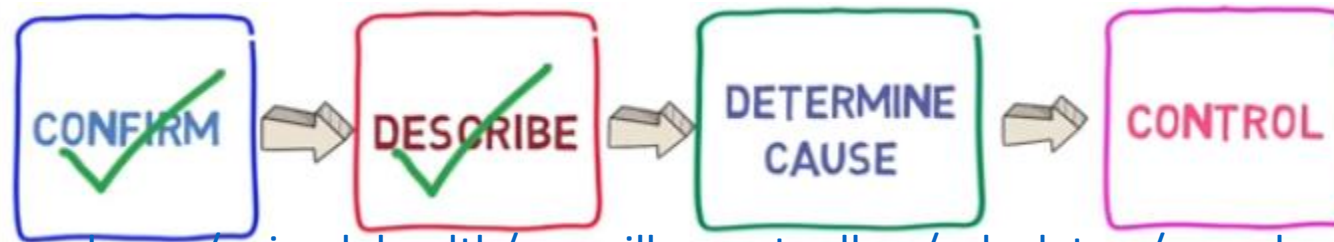
systematically



describe cases

*time
person
place*

Pause (k)



https://www.aphis.usda.gov/animal_health/surveillance_toolbox/calculators/prevalence_estimate_calculator.html

place

geographical spread
clusters?

mapping tools

Geographic Information Systems
(GIS)



person



age
sex
occupation
ethnicity

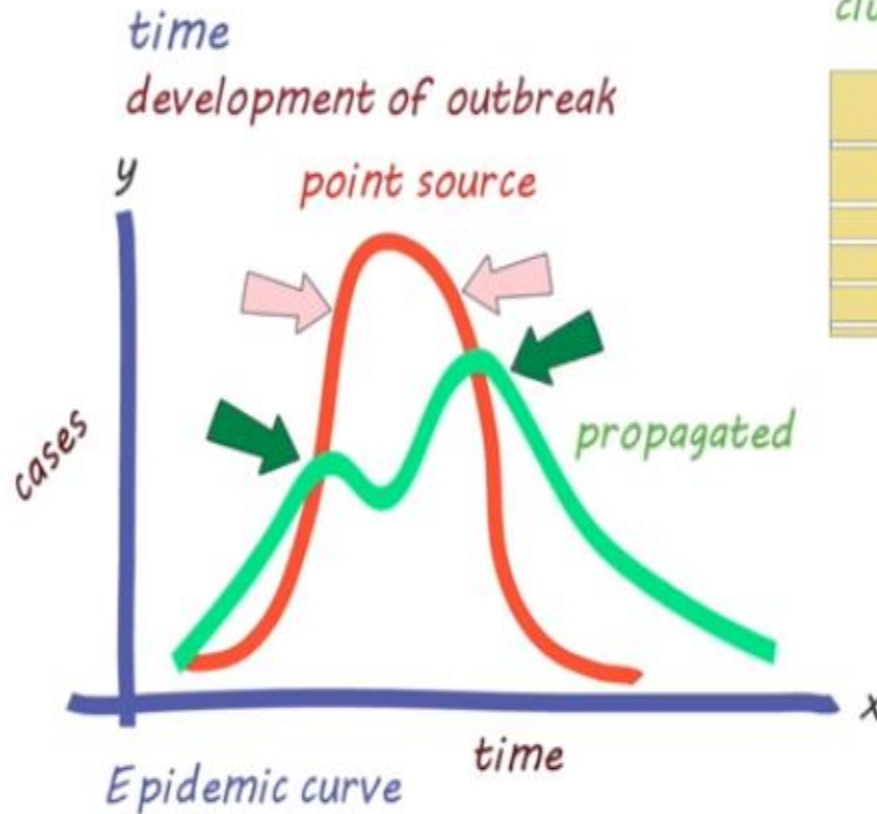
who is at risk?

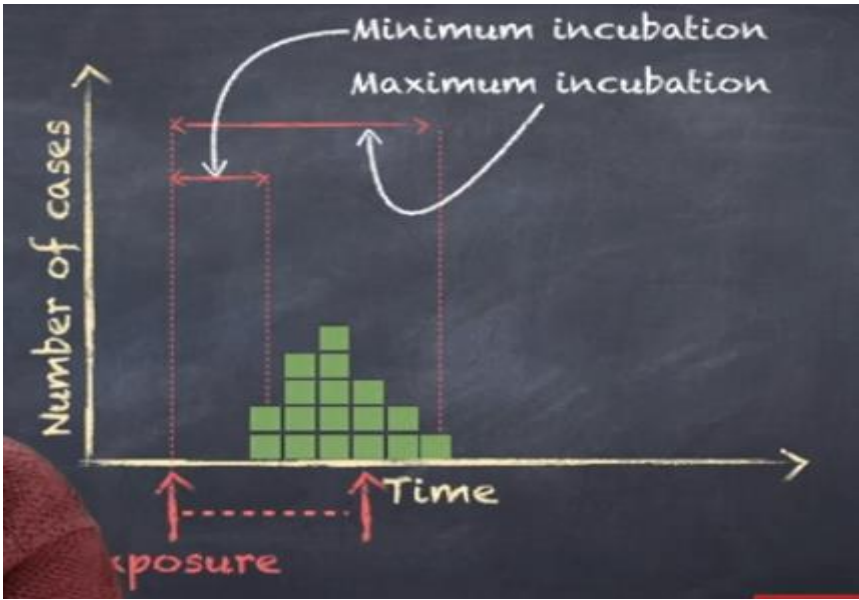
who is affected?

describe cases

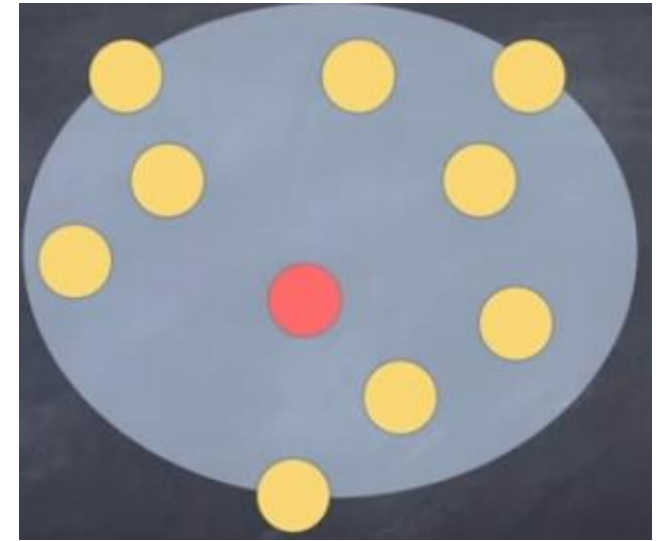
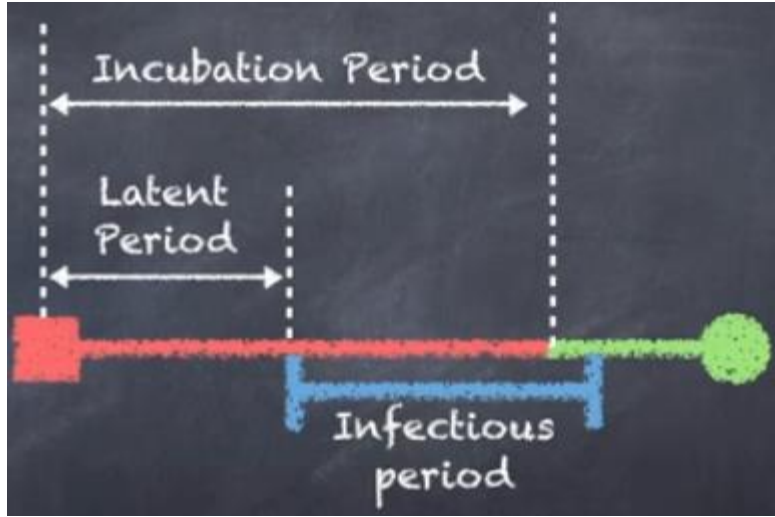


time
person
place





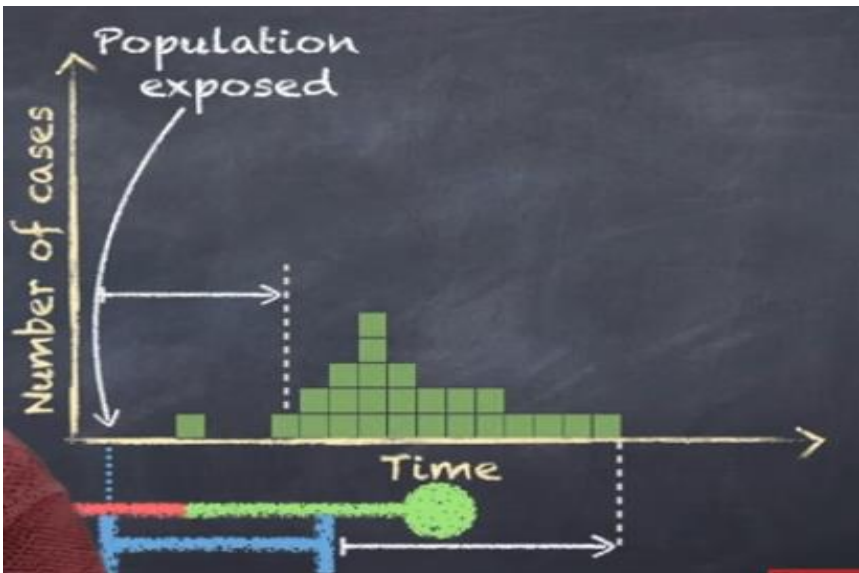
<https://shiny.vet.unimelb.edu.au/epi/epicurve/>



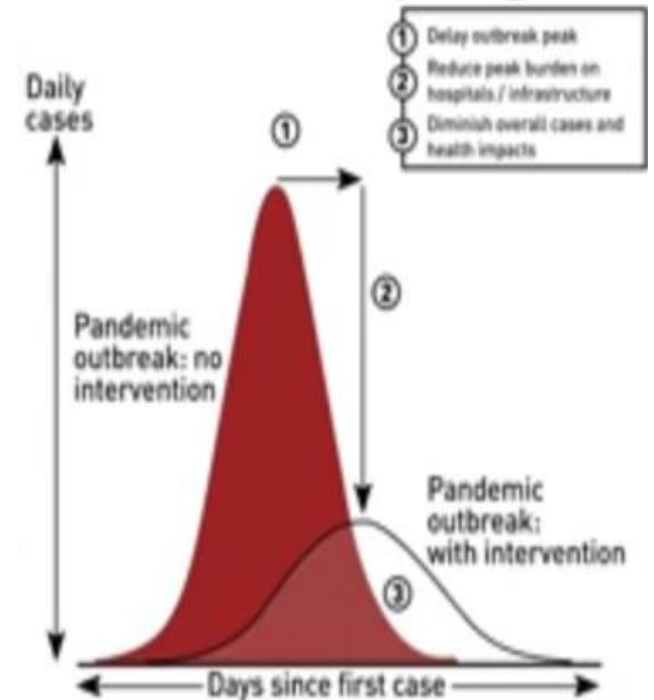
The **generation time** is the time lag between infection in a **primary case** and a **secondary case**.

<https://outbreaktools.ca/>

<https://sphweb.bumc.bu.edu/otlt/sparta/docs/AdviceonMakinganEpidemicCurve.htm>



Goals of community mitigation



DETERMINE CAUSE

What is the likely cause?



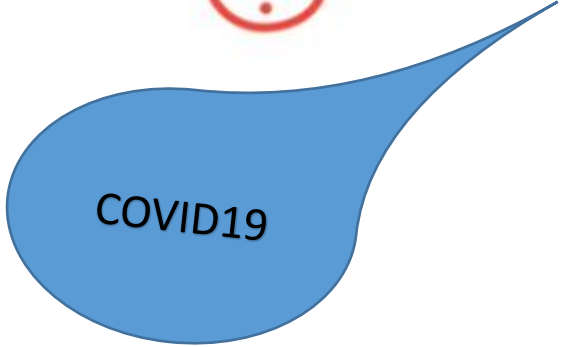
pathogen

V. Cholera

- contaminated water

Salmonella

- eggs or meat



test
 ↓
 analytical
 epi-
 study
 cohort
 case-control

laboratories → very useful
 microbiological information

environmental investigation → environmental
 factors

factor → outbreak
 ? contaminated eggs
 ? appropriate food
 storage
 ? Hygiene

3 components → Epidemiological triad



Direct

touching

intercourse

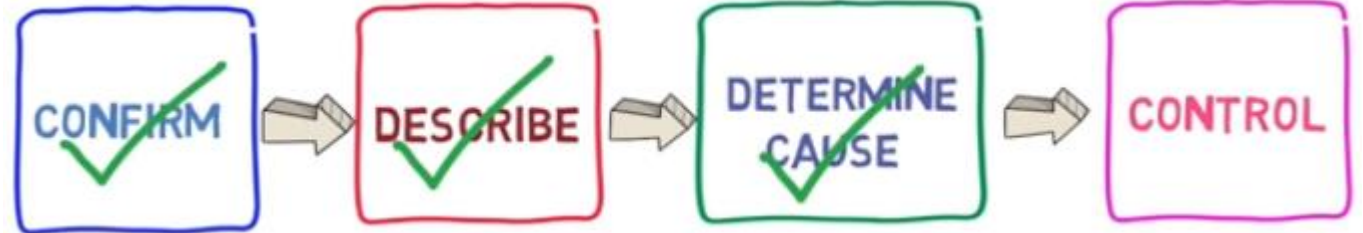
coughing

Indirect

intermediate

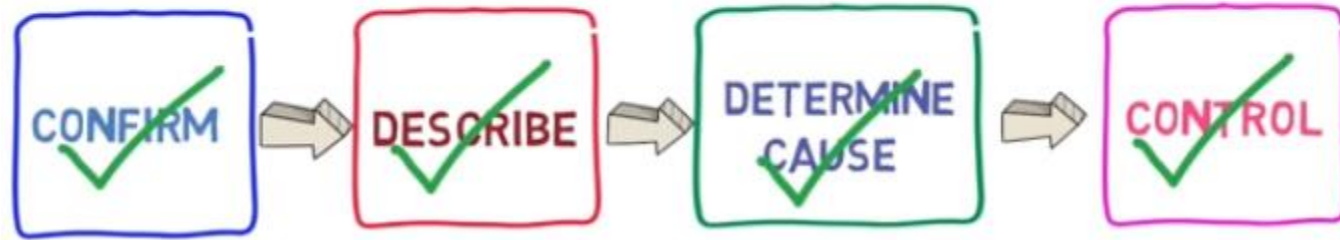
contaminated objects

vectors



OUTBREAK INVESTIGATION

systematic steps number, order, content can vary



CONTROL

*can be at any stage of investigation
transmission pathways*

*agent
host
environment*

Behavioural



mosquito repellent

Vaccination



measles vaccine

Medication



ivermectin

*Environmental
measures*



*spraying
insecticides*

*Infection
Control*



*Health
Education*

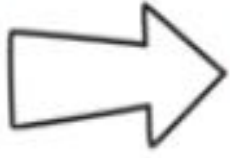


SURVEILLANCE

COMMUNICATION

important in any outbreak

accurate
timely



Internal



External



other organizations



public

media



sharing information
online
journals

protective behaviours
surveillance

reduces:
anxiety
confusion
misinformation

Who
What
Where
When
Why/how

Why

eyes and ears

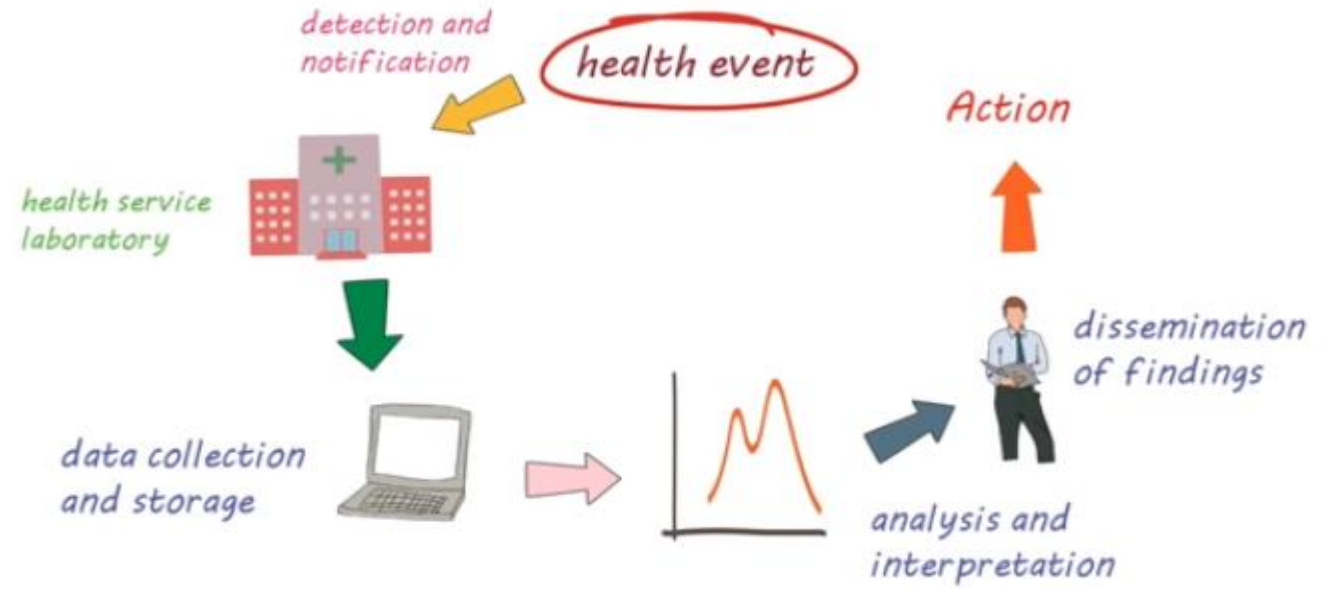
SURVEILLANCE



Duties of an Epidemiologist

- Routine disease surveillance
- Case interviews
- Data collection
- Specimen and sample collection
- Data analysis
- Disease education
- Risk communication

ELEMENTS



Active surveillance

actively sought out



outbreaks

active case finding



serosurveillance

testing blood markers



health surveys

communities
health centres
countries

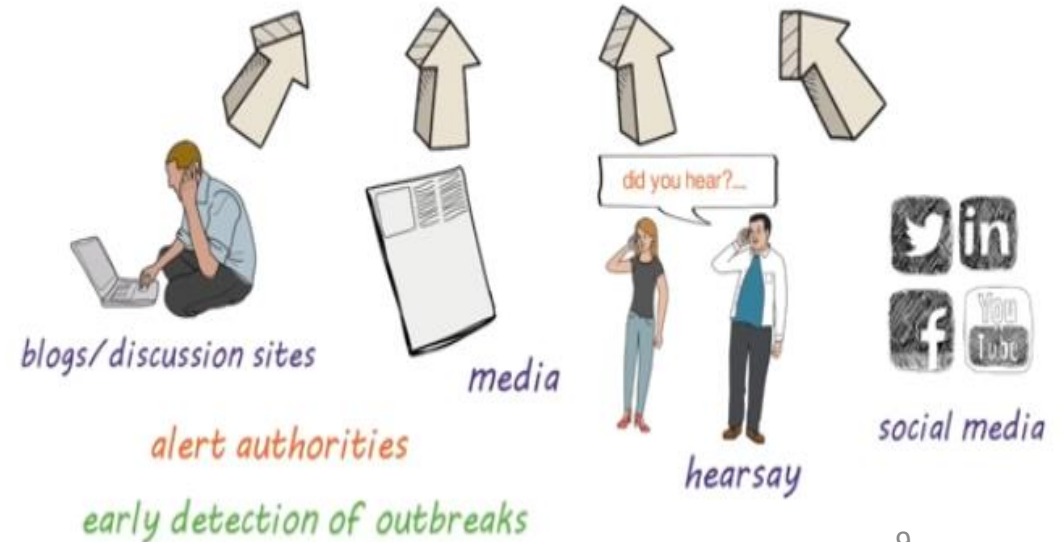
complete and better quality
resource intensive

regularly

as needed

Rumour surveillance

unofficial sources of information



TYPES OF SURVEILLANCE

Passive Surveillance

Active Surveillance

Sentinel Surveillance

Rumour Surveillance

Syndromic Surveillance

Other Types

integrative approach

best overall picture of health



Characteristics of a good surveillance system

(From US CDC)

clearly defined objectives

simplicity

flexibility

quality

acceptability

sensitivity and PPV

validity

representativeness

timeliness

stability

evaluation !!

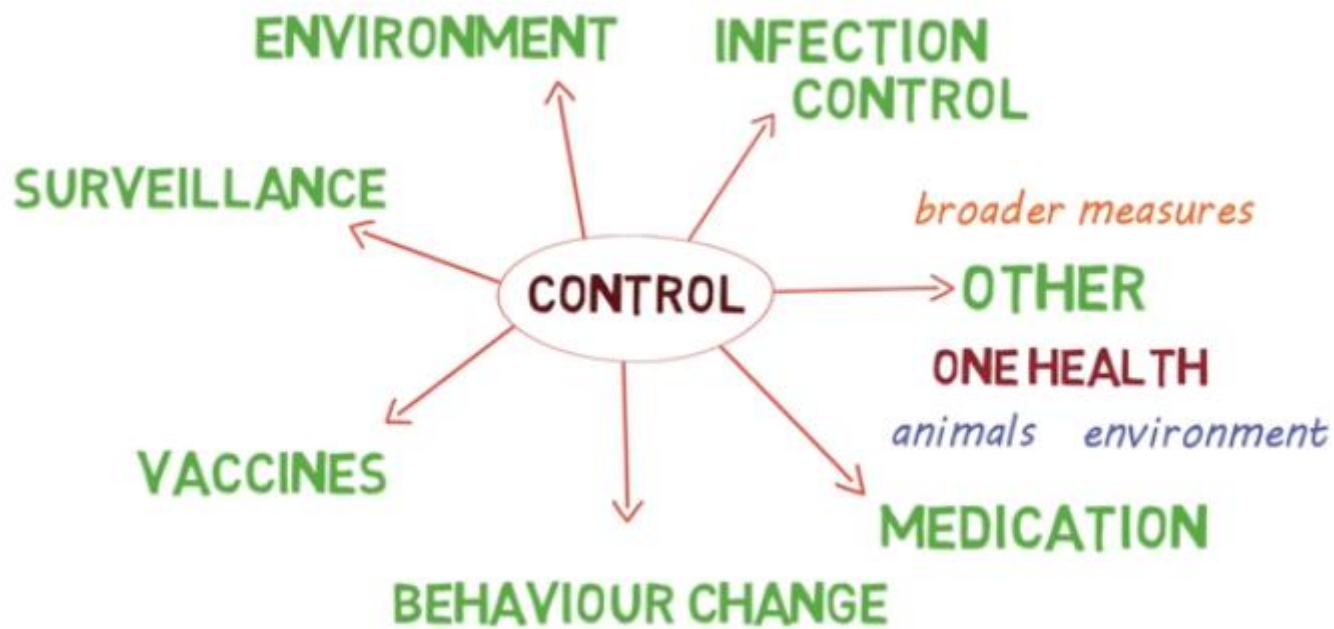
meet objectives

public health

function

information for action!!





INFECTION CONTROL

infections can spread rapidly



sterilisation

PPE

isolation

handwashing

cleaning

hospital surveillance



VACCINES

biggest successes of public health
reduction or eradication of diseases
childhood immunisationsaved countless lives
protects individual



.....and others!!
(herd immunity)

BEHAVIOUR CHANGE



condoms



hand washing



healthy diet

target of health pro



repellants





Detecting | Reporting | Isolating | Treating
public health aims to reduce transmission of infections in the population



Contact tracing

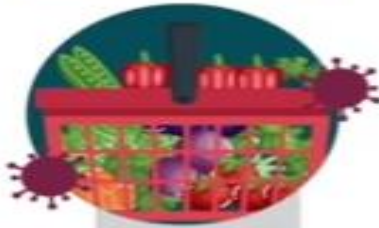
- Identifying persons who may have close contact with a person with COVID-19
- Subsequent collection of further information about these close contacts

GOALS OF CONTACT TRACING

-
- 1 **Interrupt ongoing transmission and reduce spread of an infection**
 - 2 **Establish epidemiological link or track the sources of infection and contain further spread**
 - 3 **Alert contacts to the possibility of infection and ensure timely referral for management and care**
 - 4 **Provide diagnosis, health education and psychosocial support, and treatment to those who have COVID-19**
 - 5 **Help prevent re-infection in a person previously treated of COVID-19**
 - 6 **Learn about the epidemiology of COVID-19**

**DETECT
REPORT
ISOLATE
TREAT**

SUPERMARKET



MASS GATHERINGS



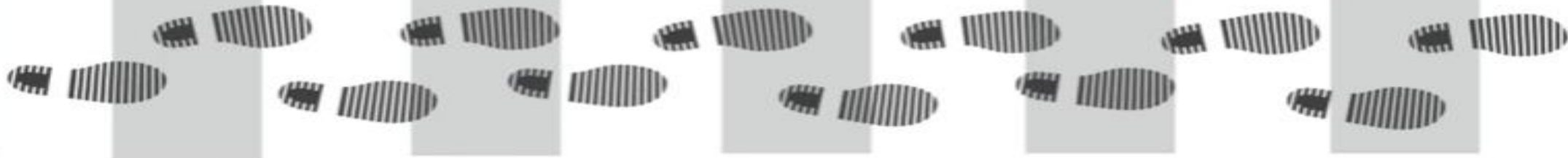
PUBLIC TRANSPORT



SCHOOLS



HOSPITALS



ADVICE

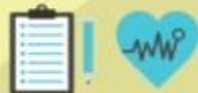
the public to **AVOID** these places, settings and venues

**DETECT
REPORT
ISOLATE
TREAT**

Isolate

**SUSPECT, PROBABLE AND
CONFIRMED CASES**

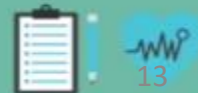
Refer to isolation centers for clinical management and care as needed



Quarantine

CLOSE CONTACTS

Refer to community quarantine centers



COVID19

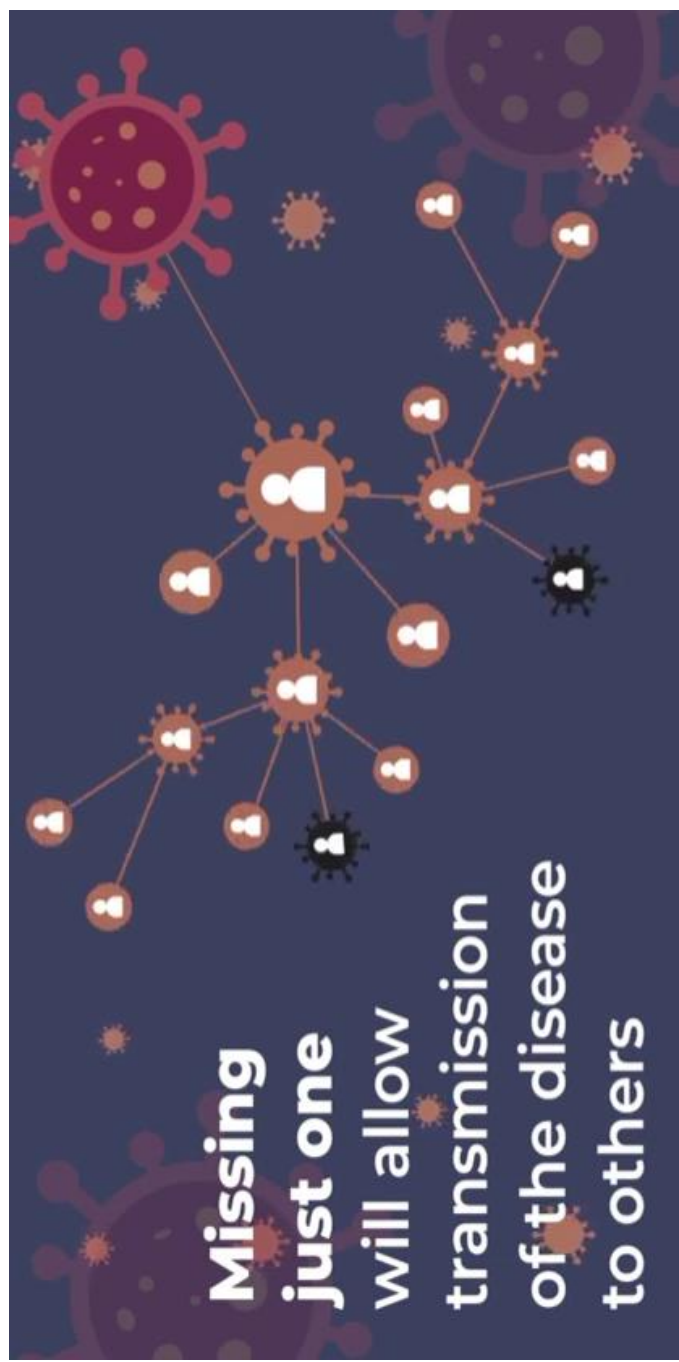
Health education on nature of disease, prevention of infection transmission



ENSURE CONFIDENTIALITY AND PRIVACY



Ahmadi A. SKUMS



Missing just one will allow transmission of the disease to others

تحلیل SWOT نظام مراقبت اپیدمی استان

ماتریس ارزیابی عوامل بیرونی		ماتریس ارزیابی عوامل درونی		حیطه ها
تهدیدها	فرصت ها	ضعف ها	قوت ها	
				ساختار
				فرایندها
				تأثیر و عملکرد

استراتژی ها برای ارتقای نظام مراقبت اپیدمی بر اساس تحلیل SWOT

استراتژی WT (ضعف - تهدید)	استراتژی ST (قوت - تهدید)	استراتژی WO (ضعف - فرصت)	استراتژی SO (قوت - فرصت)

Iran (Islamic Republic of) Situation



1,631,169
confirmed cases



60,073
deaths



Source: World Health Organization



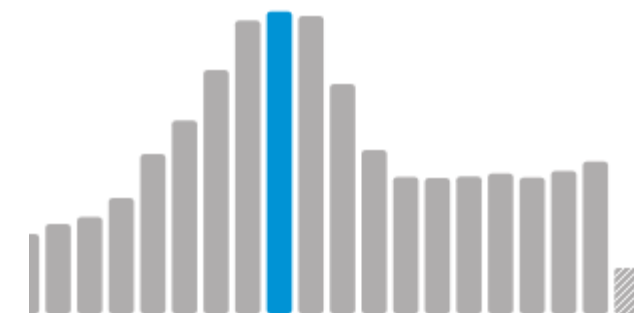
March 30, 2020
19,917 Confirmed Cases
3,246 Weekly Increase
19.47% Weekly Change

پیک اول: فروردین 99



June 1, 2020
20,475 Confirmed Cases
5,046 Weekly Increase
32.7% Weekly Change

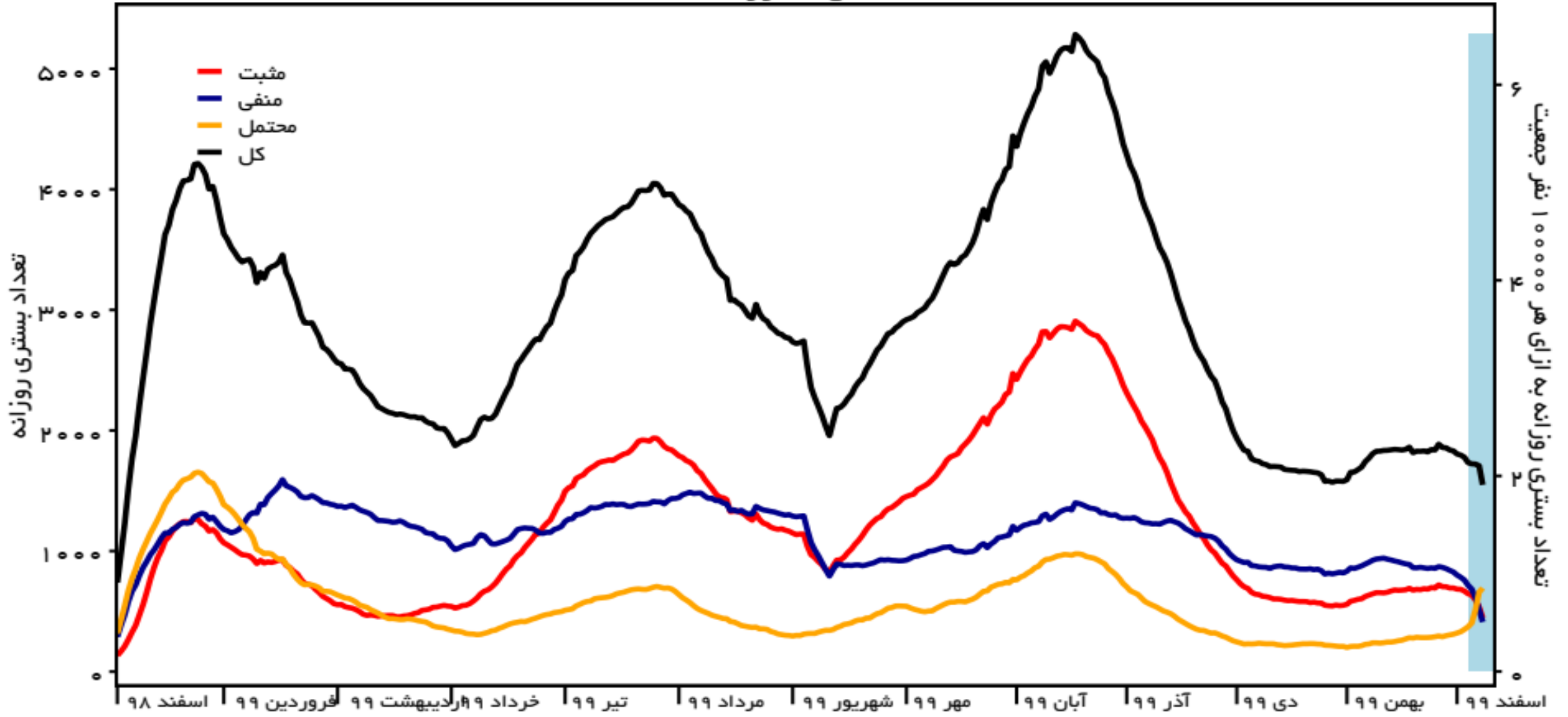
پیک دوم: هفته اول خردادماه 99



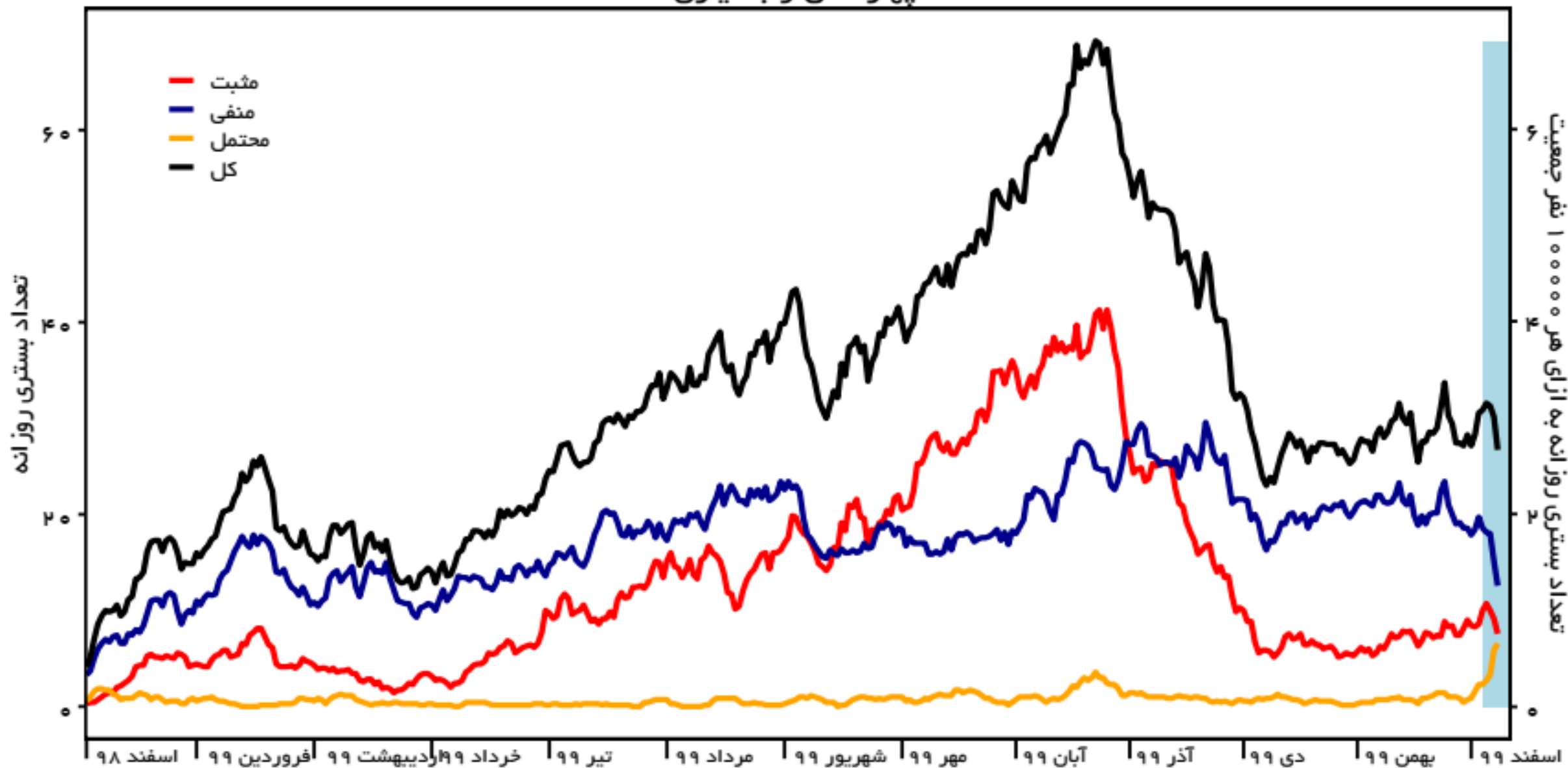
November 23, 2020
94,491 Confirmed Cases
2,708 Weekly Increase
2.95% Weekly Change

پیک سوم: هفته اول آذرماه 99

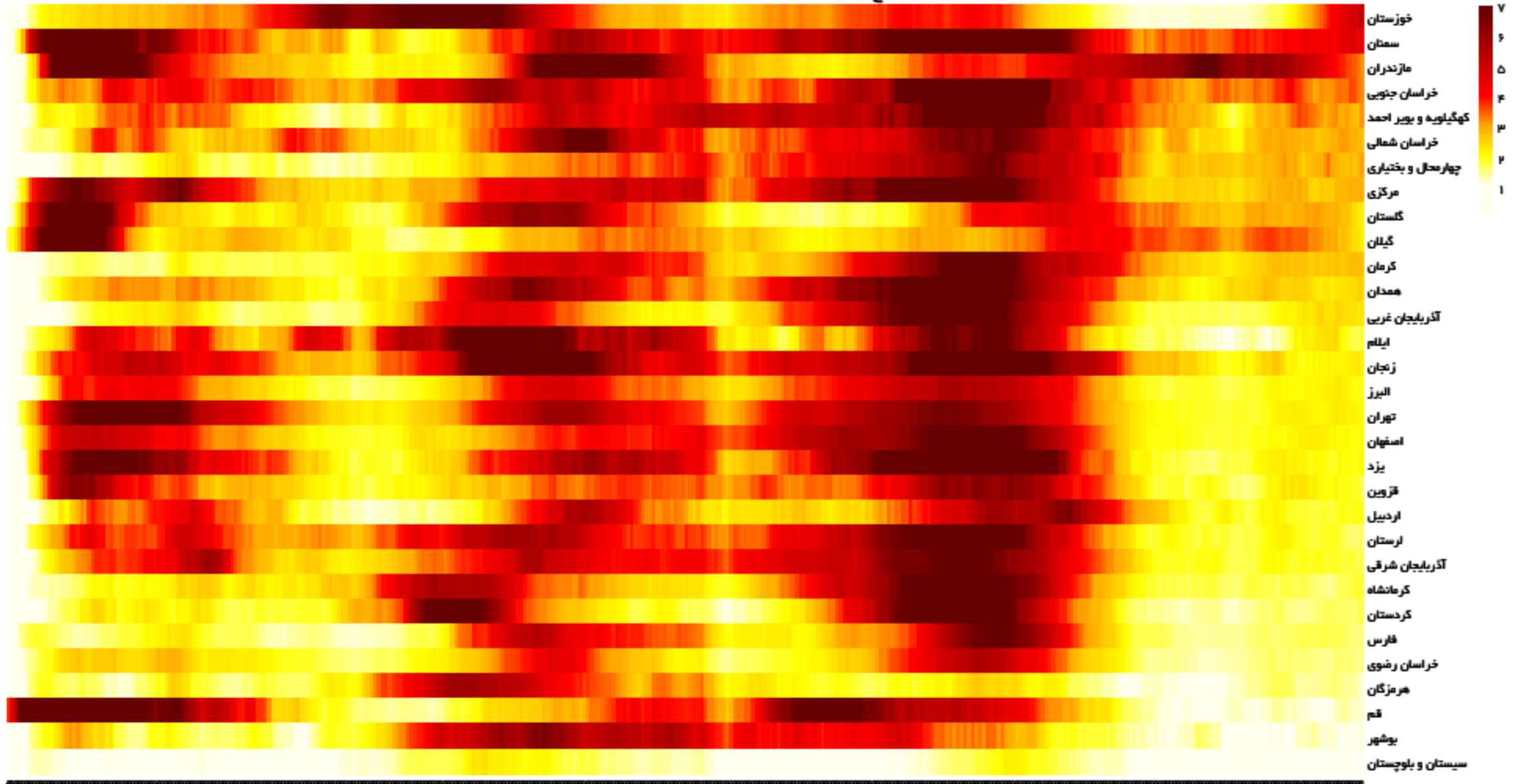
کل کشور



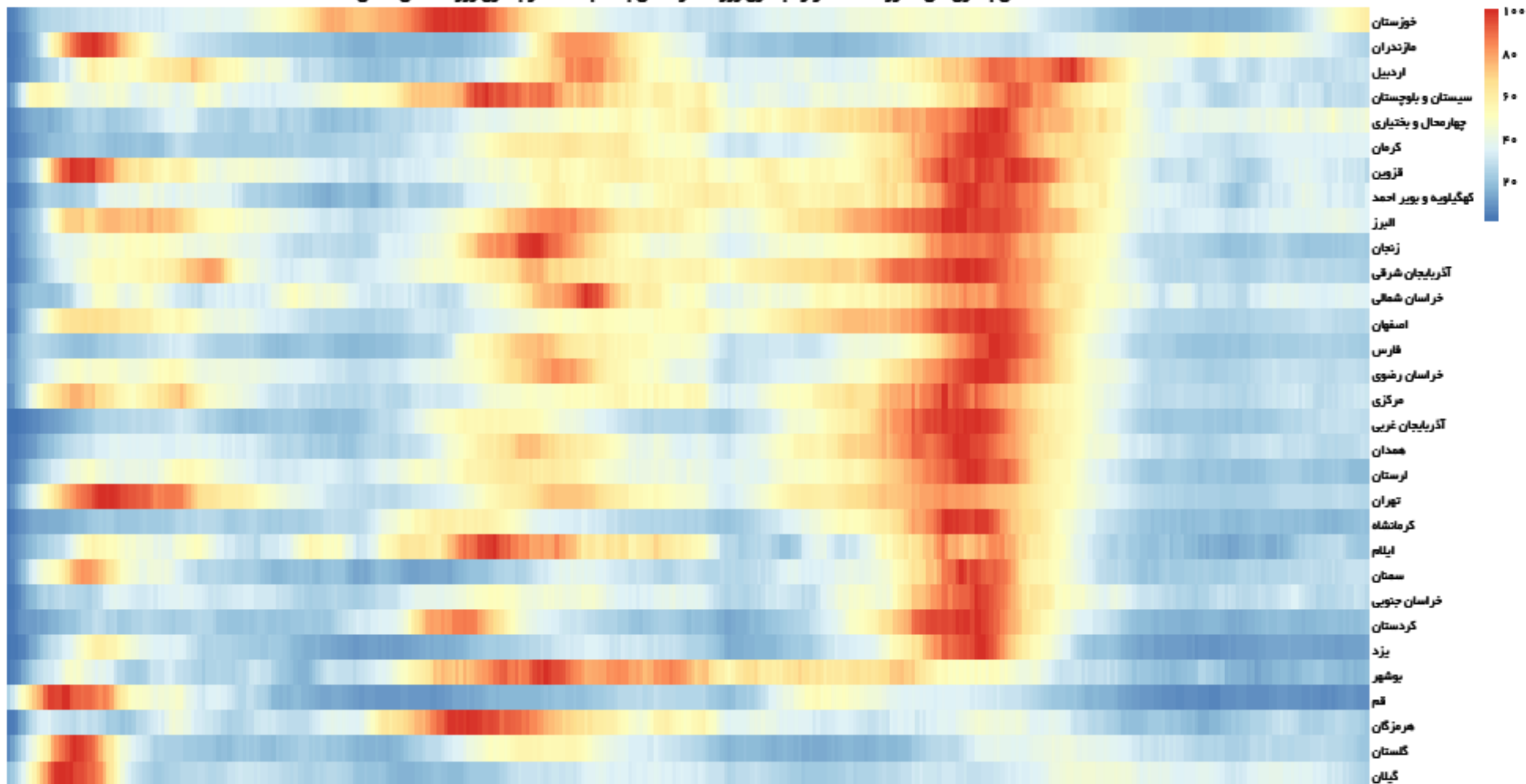
چهار محال و بختیاری



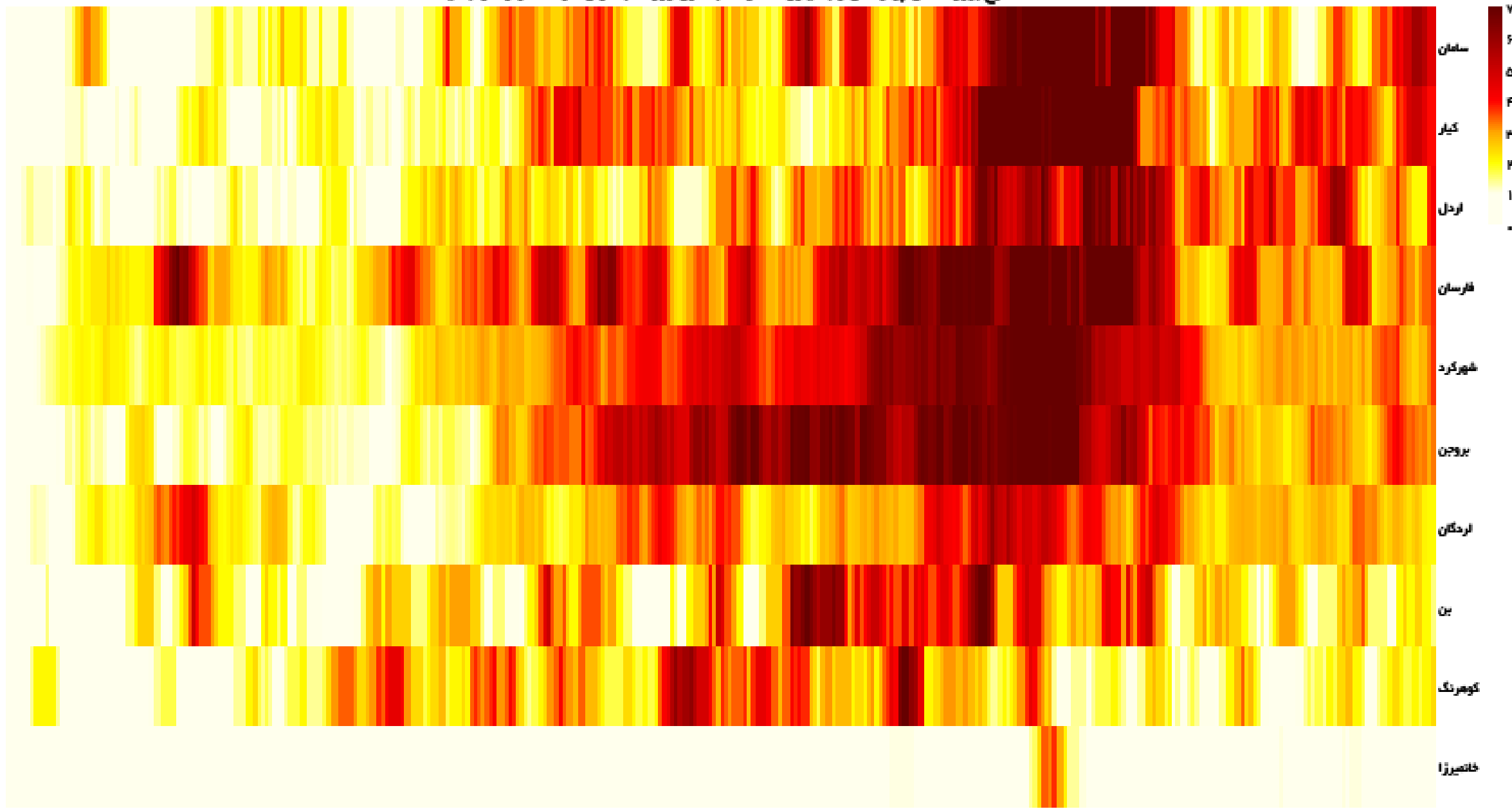
نرخ بروز کل کشور - بستری روزانه به ازای هر صد هزار نفر جمعیت



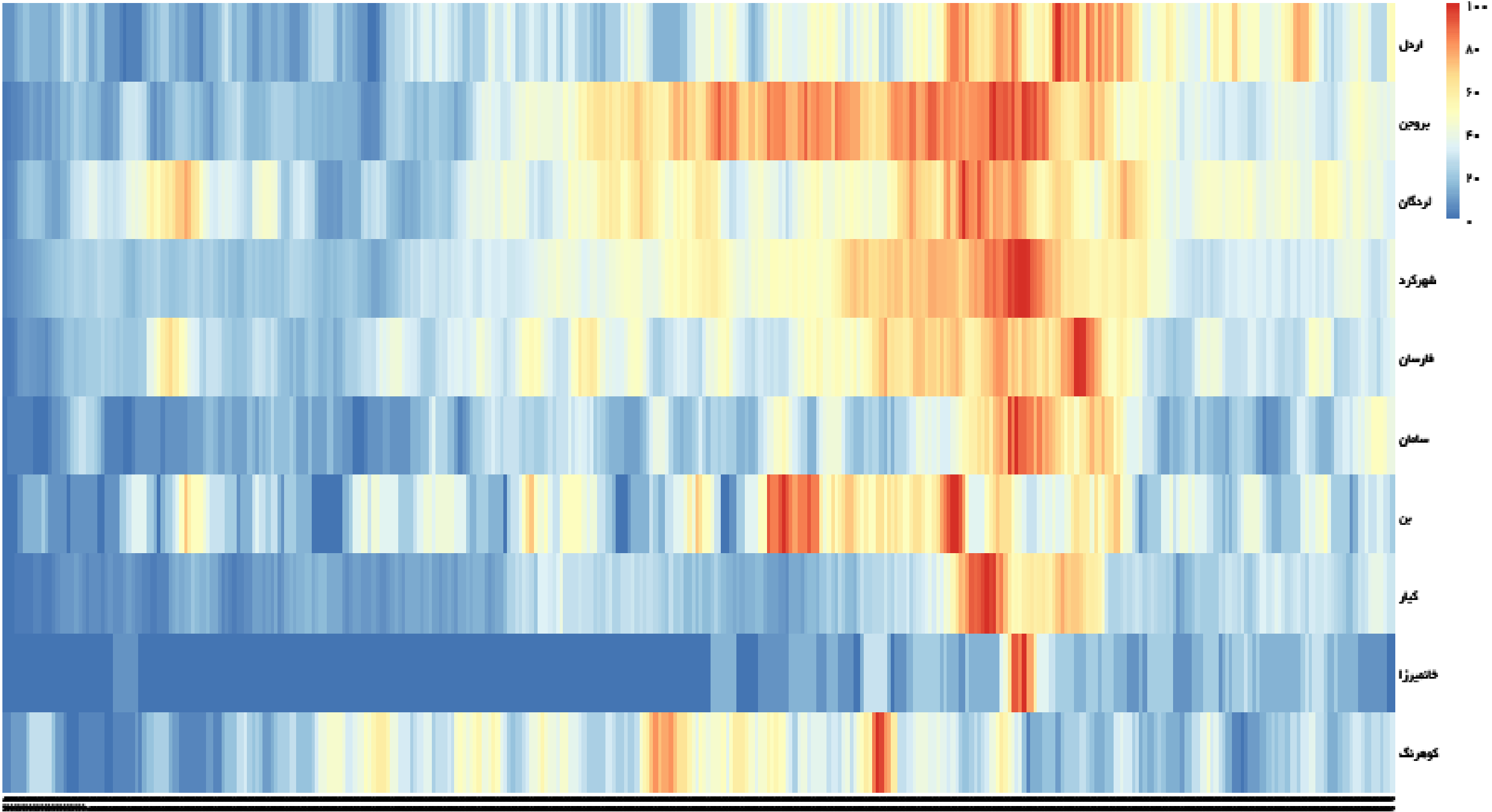
کل بستری: کل کشور - تعداد موارد بستری روزانه هر استان به نسبت حداکثر بستری روزانه همان استان



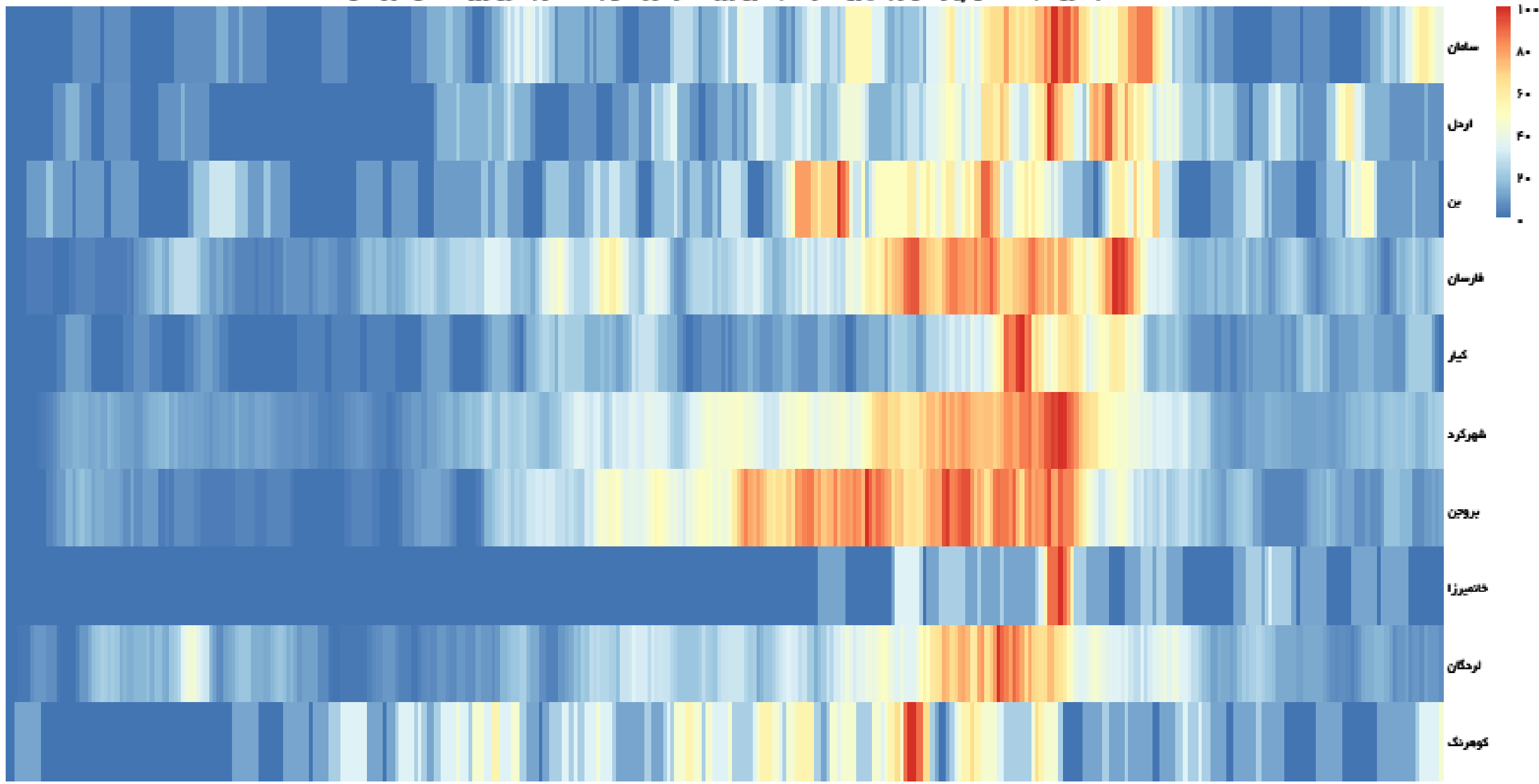
نرخ بروز استان چهارمحال و بختیاری - متوسط بستری روزانه به ازای هر صد هزار نفر جمعیت








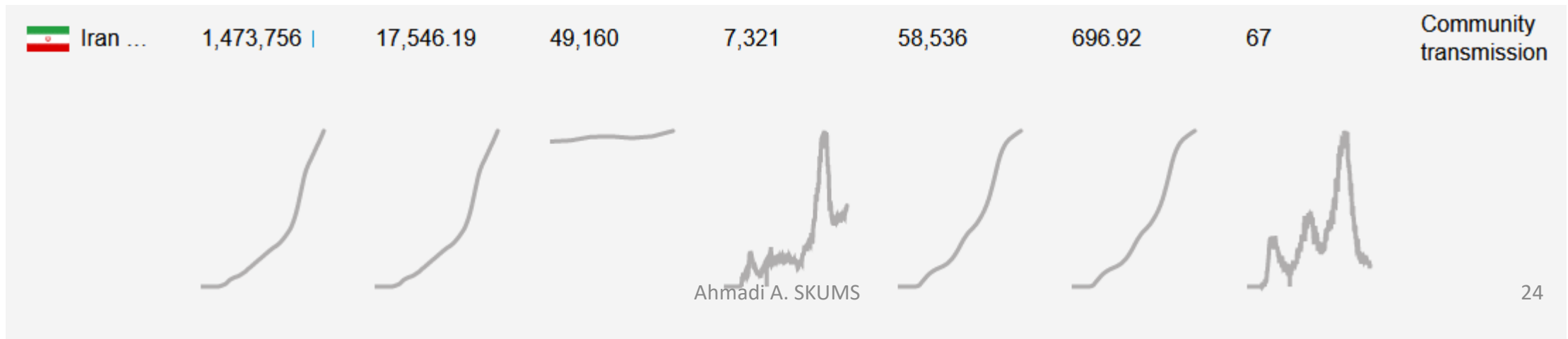
کل بستری: استان چهارمحال و بختیاری - درصد بستری روزانه هر شهرستان به حداکثر بستری روزانه همان شهرستان



بستری مثبت: استان چهارمحال و بختیاری - درصد بستری روزانه هر شهرستان به حداکثر بستری روزانه همان شهرستان

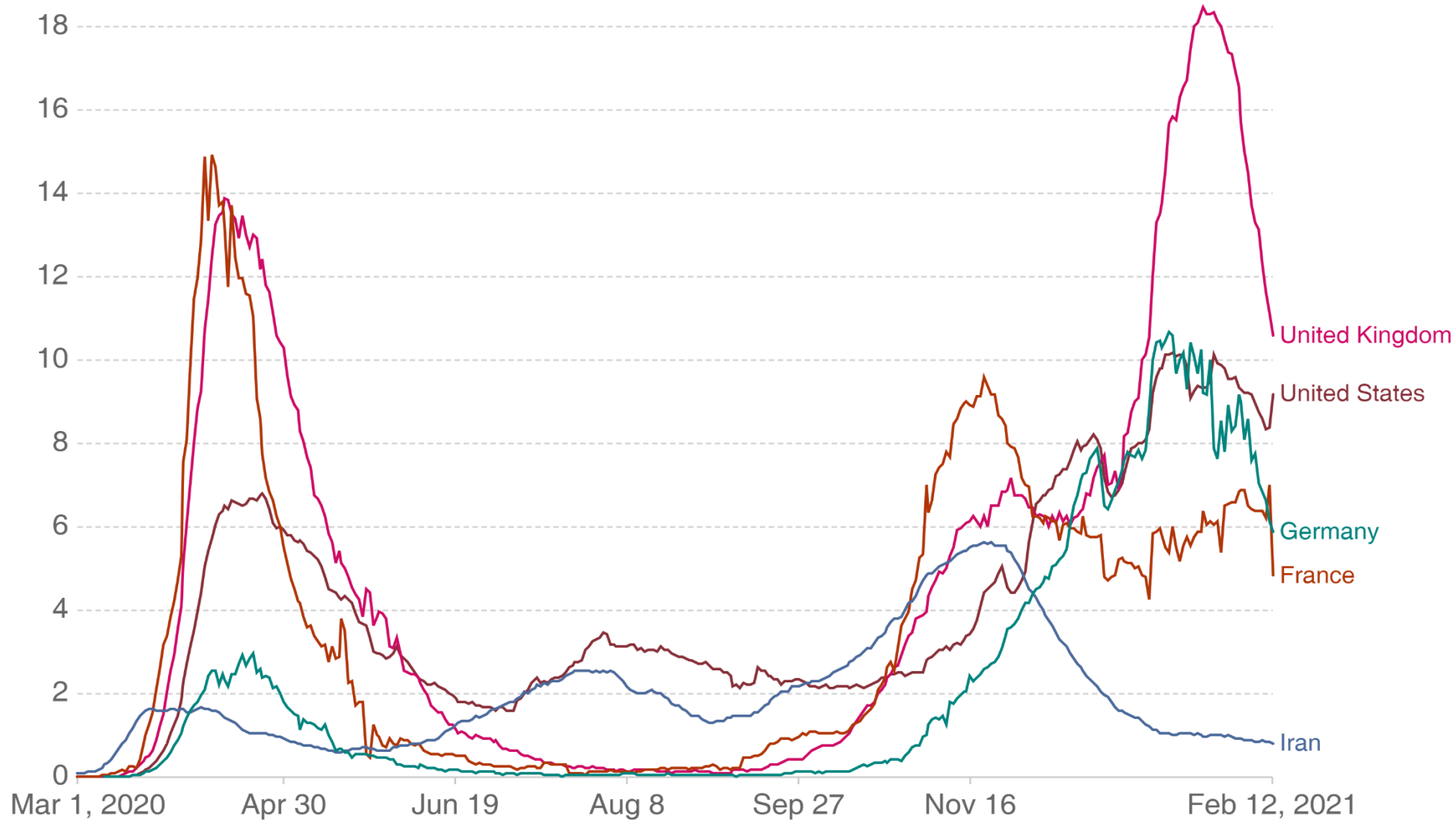


Name	Cases - cumulative total	Cases - cumulative total per 1 million population	Cases - newly reported in last 7 days	Cases - newly reported in last 24 hours	Deaths - cumulative total	Deaths - cumulative total per 1 million population	Deaths - newly reported in last 24 hours	Transmission Classification
Global	106,125,682	13,594.858	3,008,820	304,166	2,320,497	297.259	8,021	
 Unit...	26,746,377	80,804.12	816,309	91,412	459,993	1,389.7	1,449	Community transmission
 India	10,847,304	7,860.34	81,059	9,110	155,158	112.43	78	Clusters of cases
 Brazil	9,524,640	44,809.31	319,909	26,845	231,534	1,089.27	522	Community transmission
 Russ...	3,998,216	27,397.34	113,486	15,019	77,598	531.73	530	Clusters of cases
 The ...	3,959,788	58,329.96	124,001	14,104	112,798	1,661.58	333	Community transmission



Daily new confirmed COVID-19 deaths per million people

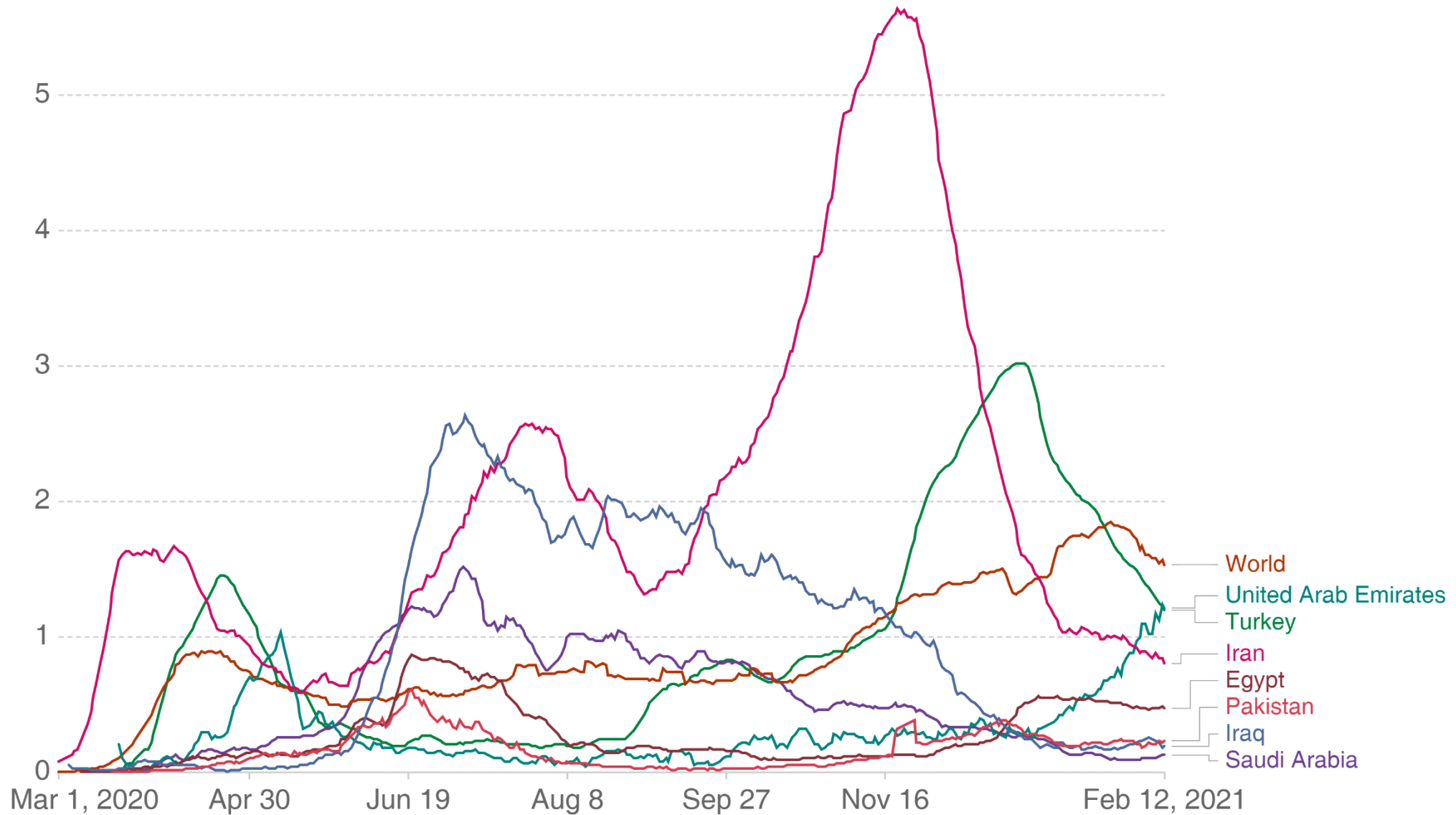
Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 13 February, 09:02 (London time)

Daily new confirmed COVID-19 deaths per million people

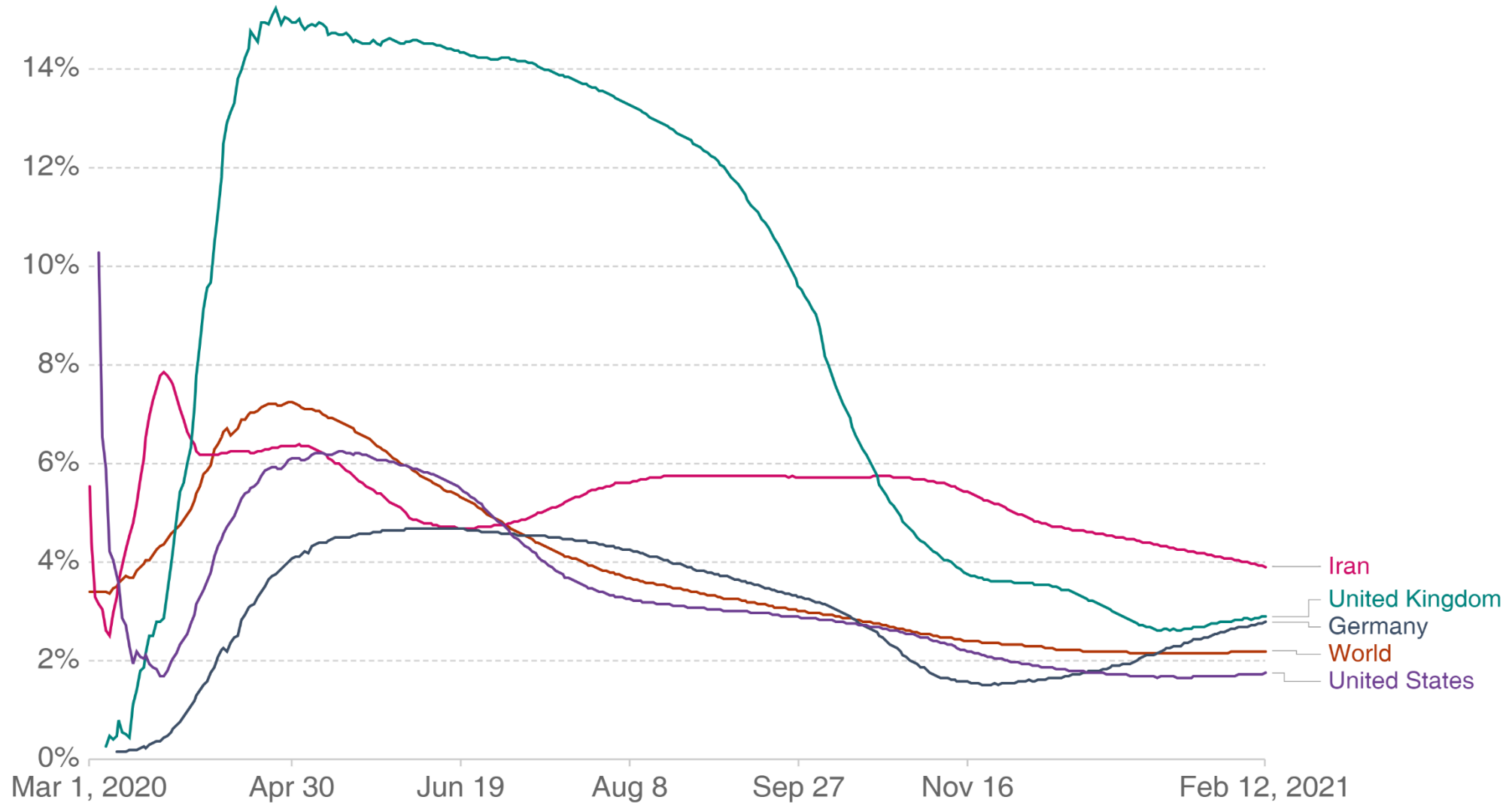
Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 13 February, 09:02 (London time)

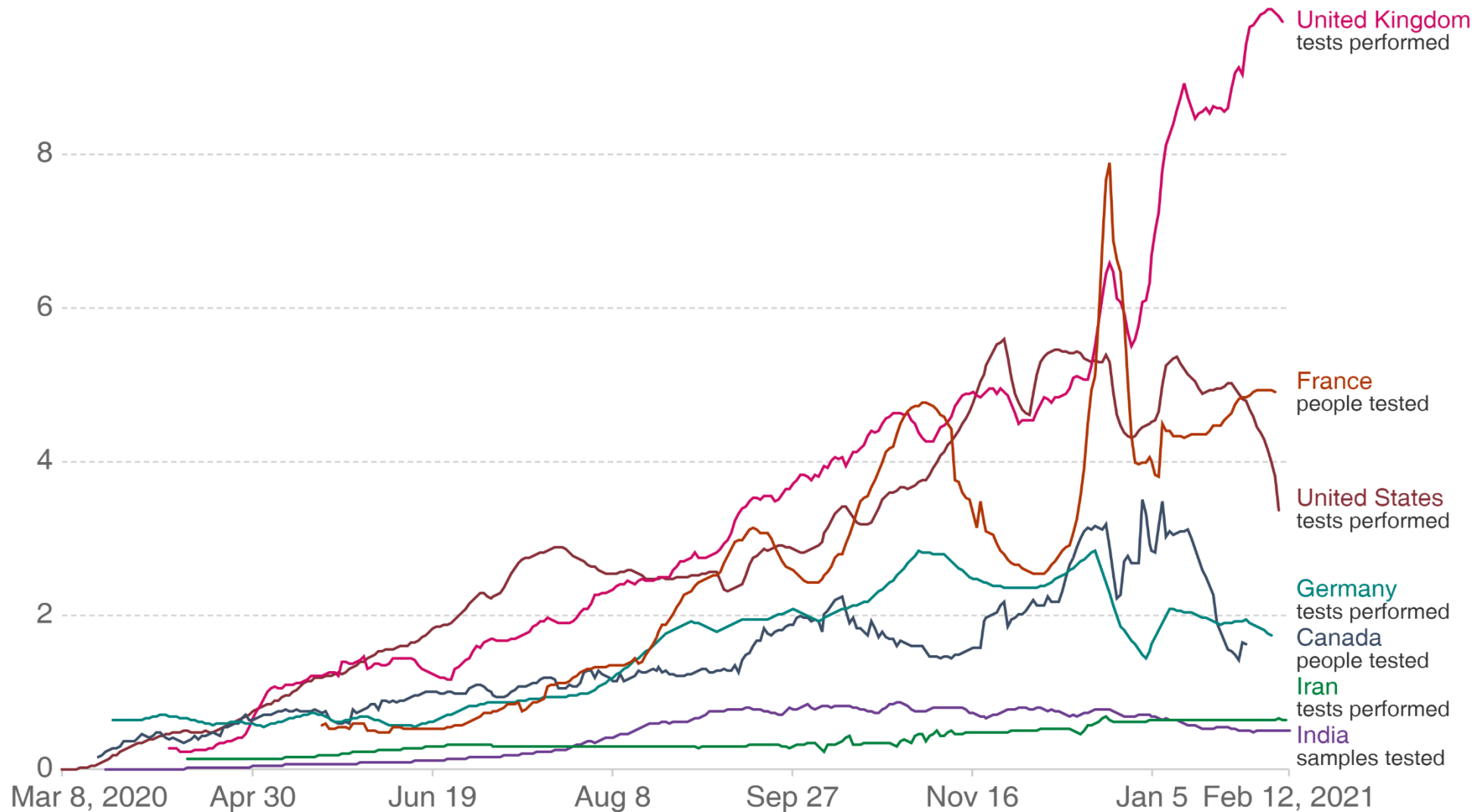
Case fatality rate of the ongoing COVID-19 pandemic

The Case Fatality Rate (CFR) is the ratio between confirmed deaths and confirmed cases. During an outbreak of a pandemic the CFR is a poor measure of the mortality risk of the disease. We explain this in detail at OurWorldInData.org/Coronavirus



Daily new COVID-19 tests per 1,000 people

Shown is the rolling 7-day average.



Source: Official data collated by Our World in Data – Last updated 13 February, 11:29 (London time)

CC BY

Note: For testing figures, there are substantial differences across countries in terms of the units, whether or not all labs are included, the extent to which negative and pending tests are included and other aspects. Details for each country can be found on ourworldindata.org/covid-testing.

References

- 1- [WHO Coronavirus Disease \(COVID-19\) Dashboard](#). Data last updated: 2021/2/13, 3:35pm CET
- 2- [Hannah Ritchie, Esteban Ortiz-Ospina, Diana Beltekian, Edouard Mathieu, Joe Hasell, Bobbie Macdonald, Charlie Giattino, and Max Roser.](#)
<https://ourworldindata.org/coronavirus>. Data last updated: 2021/2/13, 3:35pm CET
- 3- Greg Martin. Outbreak investigation and control,2017 global health on YouTube; access date:2021
- 4- Ranil Appuhamy. Outbreak Investigation - a step by step approach.2017
- 5-lets learn public health, access data:2021