Infectious Disease Control and Public Health – Global Lessons and Collaboration

Ali S. Khan, MD, MPH

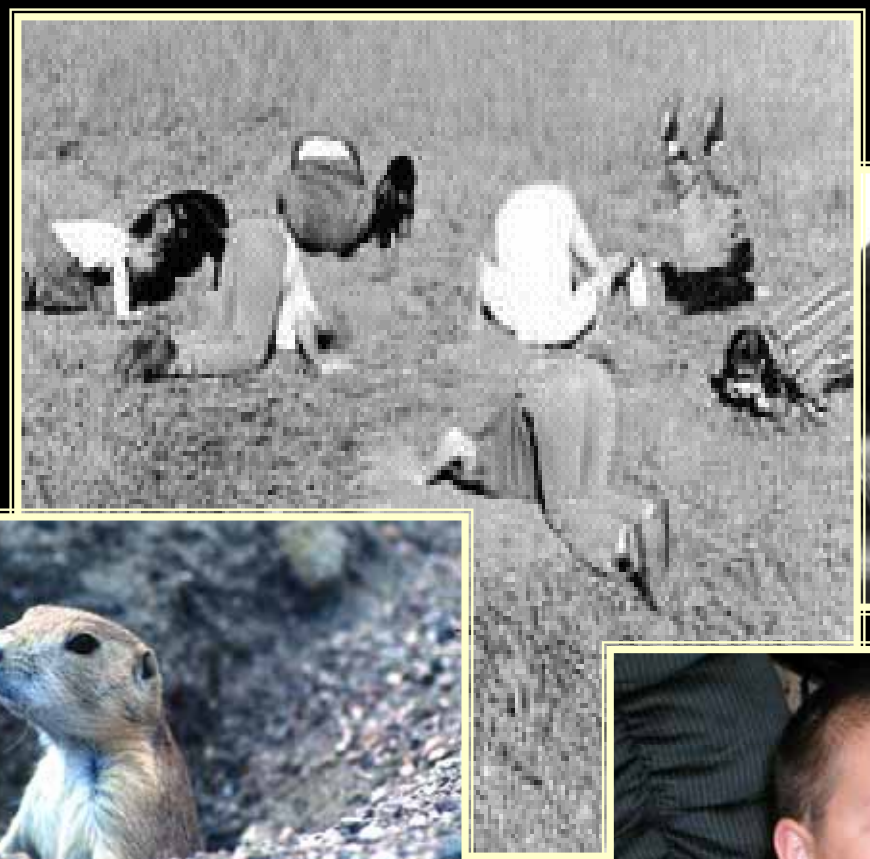
Beyond Zoonoses: One World – One Health, The Threat of Emerging Diseases to Human Health, Agriculture And Conservation: Implications for Public Policy. Beijing, November 15, 2005

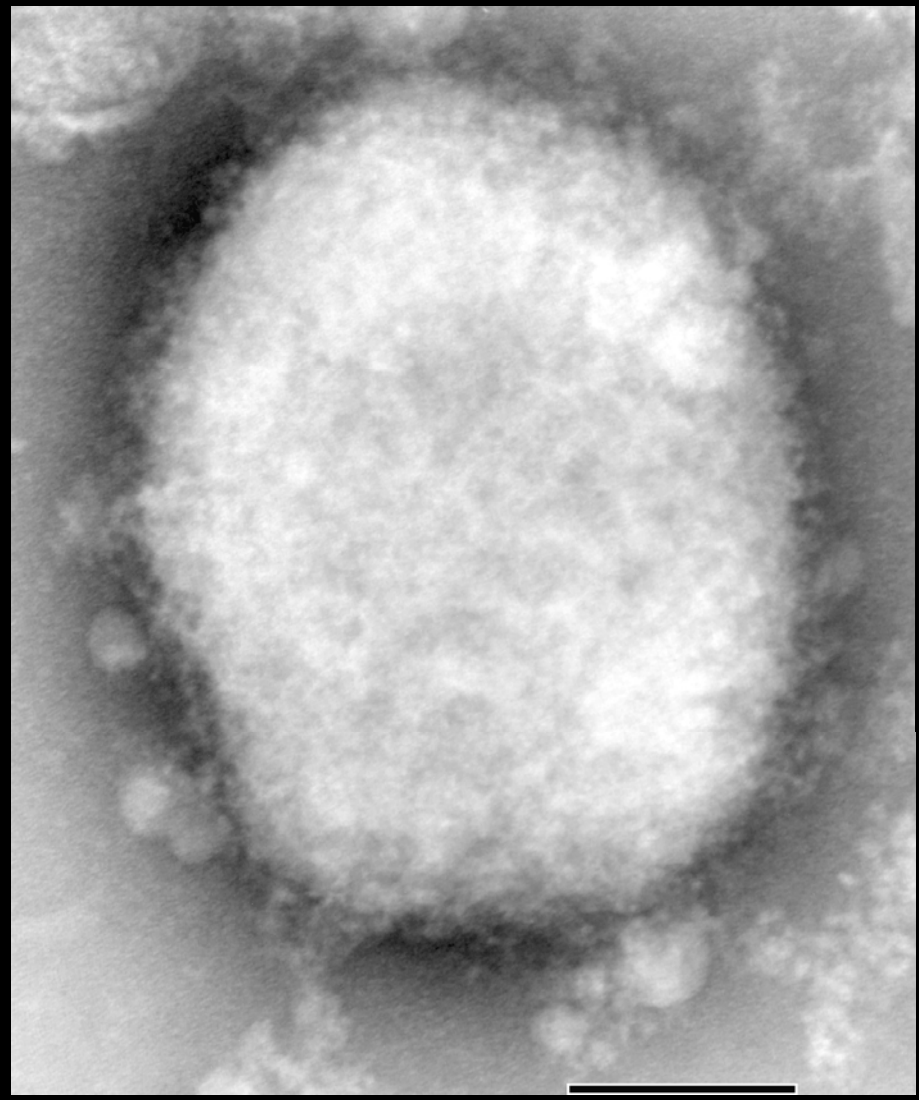
Zoonoses

- Animals are thought to be the source of more than 70% of emerging infections (Kuiken, et al., Science 2005)
- Often a disconnect between agencies monitoring the health of animals and public health agencies

By Jeff Stahler, The Cincinnati Post, for USA TODAY, June 11

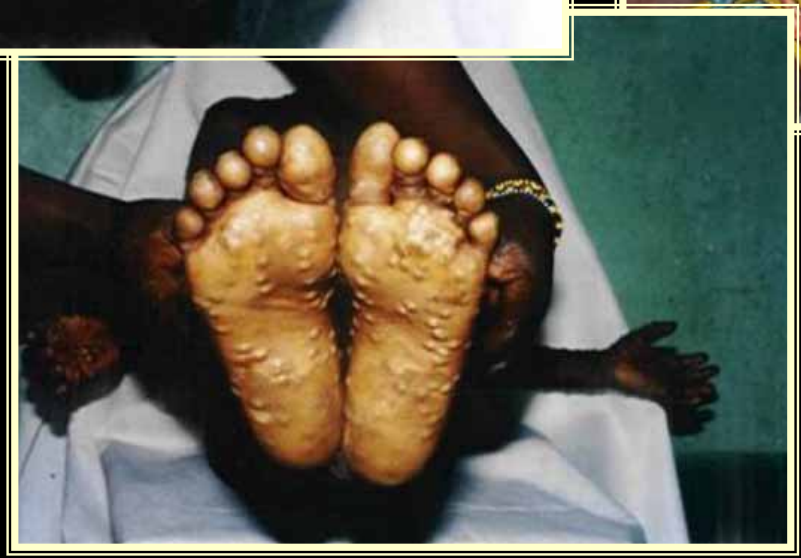
Monkeypox Outbreak, USA, 2003





Negative-stain electron micrograph of monkeypox virus identified in vesicle fluid from an infected patient within the Wisconsin 2003 outbreak. Morphologic features of virions in clinical specimens are often less distinct than cell culture isolates. Bar = 100 nm

Originally Described in monkeys in 1958.



First human outbreak described in 1970, Zaire.

Monkeypox index case, USA, May 2003

Marshfield Clinic, WI -- Kurt Reed and colleagues

11 13 15 20 22

May 11 purchased prairie dog

May 13 bitten by prairie dog

May 15 onset of illness

May 20 sought care (raised pustules)

May 22 hospitalized (fevers, sweats, disseminated pustules)

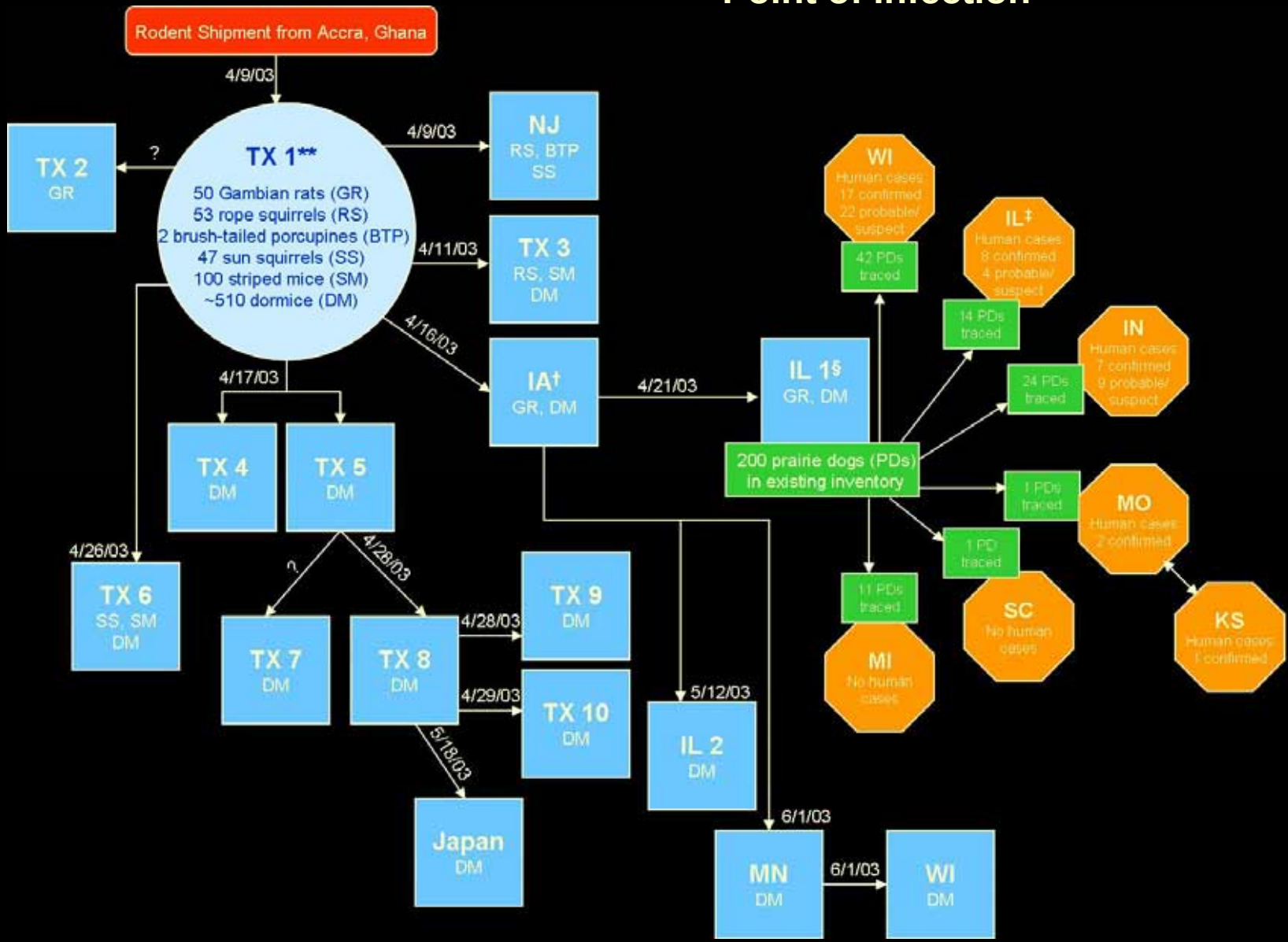
Prairie Dogs

Gunnison's prairie dog
C. gunnisoni

Utah prairie dog
C. pavidens

White-tailed prairie dog
C. leucurus

Movement of Imported African Rodents to Animal Distributors and Distribution of Prairie Dogs from Point of Infection



April 4 Shipment from Ghana to Texas

28 Genets

2 palm civets

53 rope squirrels

510 Dormice

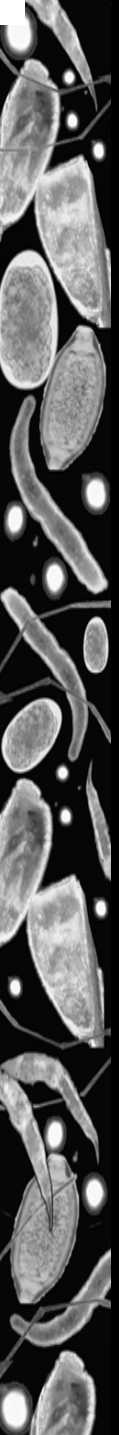
47 tree squirrels

50 Gambian giant rats

20 Cusimanses

2 brush-tailed porcupines

100 striped mice



OFFICE OF COMMUNICATION
1600 Clifton Rd., MS D25, Atlanta, GA 30333 - Ph. 404-639-3286 FAX: 404-639-7394

MEDIA RELATIONS

Monkeypox
Report of Cases in the United States

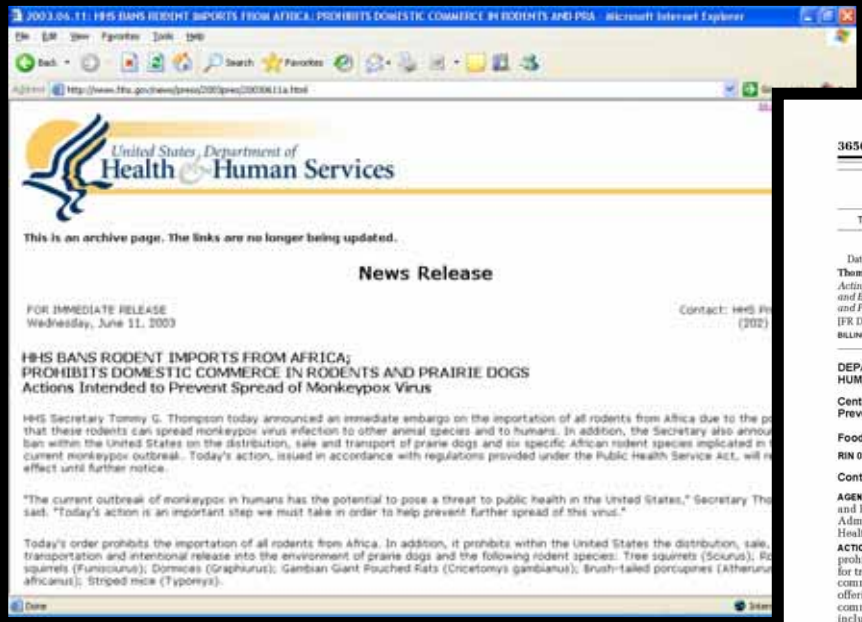
Data reported to CDC as of **July 30, 2003**. This is the final report.

State	Cases Under Investigation	Lab-Confirmed Cases
Illinois	13	9
Indiana	16	7
Kansas	1	1
Missouri	2	2
Ohio	1	0
Wisconsin	39	18
Total	**72**	**37**

For more information, visit the CDC Monkeypox web site.
(http://www.cdc.gov/ncidod/monkeypox/index.htm)

Preparedness & Response
准备工作和应对措施

- Public health systems公共健康系统
- Infrastructure组成机构
- Mobilization采取的行动
- Collaboration合作
  - FDA, APHIS, USDA, FWS, DoI, DoT, Homeland Security药监局，植保站和畜牧兽医站，农业部，野外监测站，环保局，交通管理部门，安全部门
  - State & Local authorities国家及地方各级部门



United States Department of Health & Human Services

This is an archive page. The links are no longer being updated.

News Release

FOR IMMEDIATE RELEASE
Wednesday, June 11, 2003

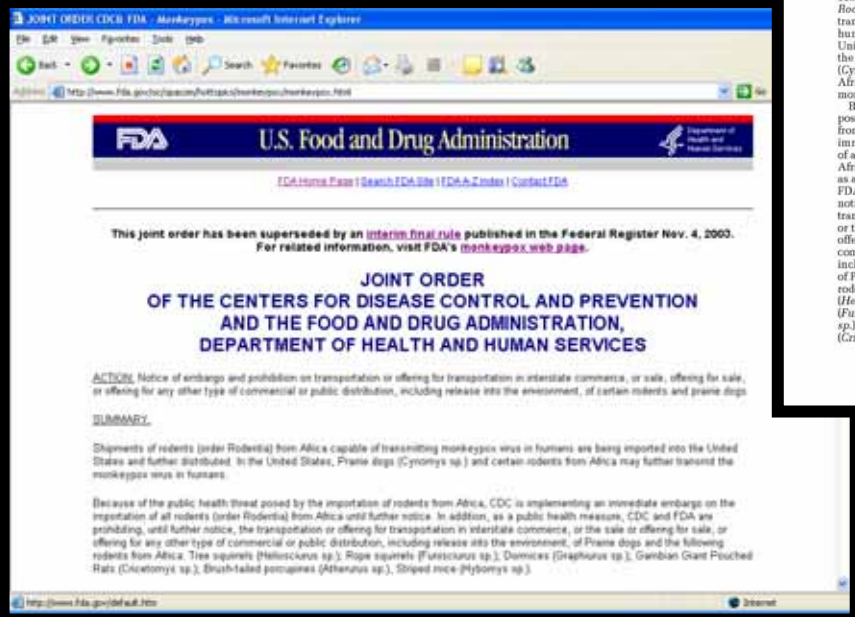
Contact: HHS Pr
(202)

HHS BANS RODENT IMPORTS FROM AFRICA; PROHIBITS DOMESTIC COMMERCE IN RODENTS AND PRAIRIE DOGS
Actions Intended to Prevent Spread of Monkeypox Virus

HHS Secretary Tommy G. Thompson today announced an immediate embargo on the importation of all rodents from Africa due to the p
that these rodents can spread monkeypox virus infection to other animal species and to humans. In addition, the Secretary also annou
ban within the United States on the distribution, sale and transport of prairie dogs and six specific African rodent species implicated in
current monkeypox outbreak. Today's action, issued in accordance with regulations provided under the Public Health Service Act, will
effect until further notice.

"The current outbreak of monkeypox in humans has the potential to pose a threat to public health in the United States," Secretary Tho
said. "Today's action is an important step we must take in order to help prevent further spread of this virus."

Today's order prohibits the importation of all rodents from Africa. In addition, it prohibits within the United States the distribution, sale,
transportation and intentional release into the environment of prairie dogs and the following rodent species: Tree squirrels (Sciurus); R
squirrels (Funisciurus); Dormices (Graphiurus); Gambian Giant Pouched Rats (Cricetomys gambianus); Brush-tailed porcupines (Atherurus
africanus); Striped mice (Typomys).



U.S. Food and Drug Administration

FDA Home Page | Search FDA Site | FDA A-Z Index | Contact FDA

This joint order has been superseded by an interim final rule published in the Federal Register Nov. 4, 2003. For related information, visit FDA's monkeypox web page.

JOINT ORDER
OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION AND THE FOOD AND DRUG ADMINISTRATION, DEPARTMENT OF HEALTH AND HUMAN SERVICES

ACTION: Notice of embargo and prohibition on transportation or offering for transportation in interstate commerce, or sale, offering for sale, or offering for any other type of commercial or public distribution, including release into the environment, of certain rodents and prairie dogs

SUMMARY:

Shipments of rodents (order Rodentia) from Africa capable of transmitting monkeypox virus in humans are being imported into the United States and further distributed. In the United States, Prairie dogs (Cynomys sp.) and certain rodents from Africa may further transmit the monkeypox virus in humans.

Because of the public health threat posed by the importation of rodents from Africa, CDC is implementing an immediate embargo on the importation of all rodents (order Rodentia) from Africa until further notice. In addition, as a public health measure, CDC and FDA are prohibiting, until further notice, the transportation or offering for transportation in interstate commerce, or the sale or offering for sale, or offering for any other type of commercial or public distribution, including release into the environment, of Prairie dogs and the following rodents from Africa: Tree squirrels (Heliosciurus sp.); Rope squirrels (Funisciurus sp.); Dormices (Graphiurus sp.); Gambian Giant Pouched Rats (Cricetomys sp.); Brush-tailed porcupines (Atherurus sp.), Striped mice (Hybomys sp.).

Title	Number of respondents	Number of responses/ respondent	Burden per response (in hrs.)	Total burden (hrs.)
Total				67,289

Dated: June 12, 2003.
Thomas A. Bartenfeld,
Acting Associate Director for Policy, Planning and Evaluation, Centers for Disease Control and Prevention.
[FR Doc. 03–15330 Filed 6–17–03; 8:45 am]
BILLING CODE 4163–18–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention

Food and Drug Administration

RIN 0920–AA03

Control of Communicable Diseases

AGENCIES: Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), Department of Health and Human Services (HHS).

ACTION: Notice of embargo and prohibition on transportation or offeri for transportation in interstate commerce, or sale, offering for sale, o offering for any other type of commercial or public distribution, including release into the environmen of certain rodents and Prairie dogs.

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This prohibition does not apply to

involved in the outbreak will likely change as the investigation continues.

Onset of illness among patients began

Rules and Regulations

Federal Register
Vol. 68, No. 213
Tuesday, November 4, 2003

This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are keyed to and codified in the Code of Federal Regulations, which is published under 50 titles pursuant to 44 U.S.C. 1510.

The Code of Federal Regulations is sold by the Superintendent of Documents. Prices of new books are listed in the first FEDERAL REGISTER issue of each week.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Parts 16 and 1240

[Docket No. 2003N–0400]

RIN 0910–ZA21

Centers for Disease Control and Prevention

42 CFR Part 71

Control of Communicable Diseases; Restrictions on African Rodents, Prairie Dogs, and Certain Other Animals

AGENCIES: Centers for Disease Control and Prevention, Food and Drug Administration (HHS).

ACTION: Interim final rule; opportunity for public comment.

SUMMARY: The Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) are issuing this interim final rule to amend their regulations to establish new restrictions and modify existing restrictions on the import, capture, transport, sale, barter, exchange, distribution, and release of African rodents, prairie dogs, and certain other animals. We are taking this action to prevent the spread of monkeypox, a communicable disease, in the United States.

DATES: The interim final rule is effective on November 4, 2003. Submit written or electronic comments on this interim final rule by January 20, 2004.

ADDRESSES: *For FDA:* Send written comments on the rule and on the information collection to the Division of Dockets Management (HFA–305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852. Submit electronic comments to *http://www.fda.gov/dockets/ecomments.*

For CDC: Send written comments on the information collection to Anne O'Connor, CDC Assistant Reports Clearance Officer, 1600 Clifton Rd., MS E11, Atlanta, GA 30333. Comments on the rule itself should be sent to FDA's Division of Dockets Management (see FDA addresses).

FOR FURTHER INFORMATION CONTACT:

For information regarding FDA: Philip L. Chao, Office of Policy and Planning (HF–23), Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857, 301–827–0557.

For information regarding CDC: James E. Barrow, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Mailstop C–14, 1600 Clifton Rd., Atlanta, GA 30333, 404–498–1600.

SUPPLEMENTARY INFORMATION:

I. What Is Monkeypox, and How Did It Spread in the United States?

Monkeypox is a rare, zoonotic, viral disease that occurs primarily in the rain forest countries in central and west Africa. (A zoonotic disease is a disease of animals that can be transmitted to humans under natural conditions.) The illness was first noted in monkeys in 1958 (which explains its name), but, in Africa, serologic evidence of monkeypox infection has been found in many other species, including some species of primates, rodents, and lagomorphs (which includes such animals as rabbits). African rodents are considered to be the most likely natural host of the monkeypox virus (Ref. 1).

In humans, monkeypox is marked by rashes that are similar to those seen in smallpox; other signs and symptoms include a temperature at or above 99.3 degrees, chills and/or sweats, headache, backache, lymphadenopathy (a disease of the lymph nodes), sore throat, cough, and shortness of breath (Ref. 2). The disease's incubation period is approximately 12 days (Ref. 3). In Africa, monkeypox has a mortality rate in humans ranging from 1 to 10 percent.

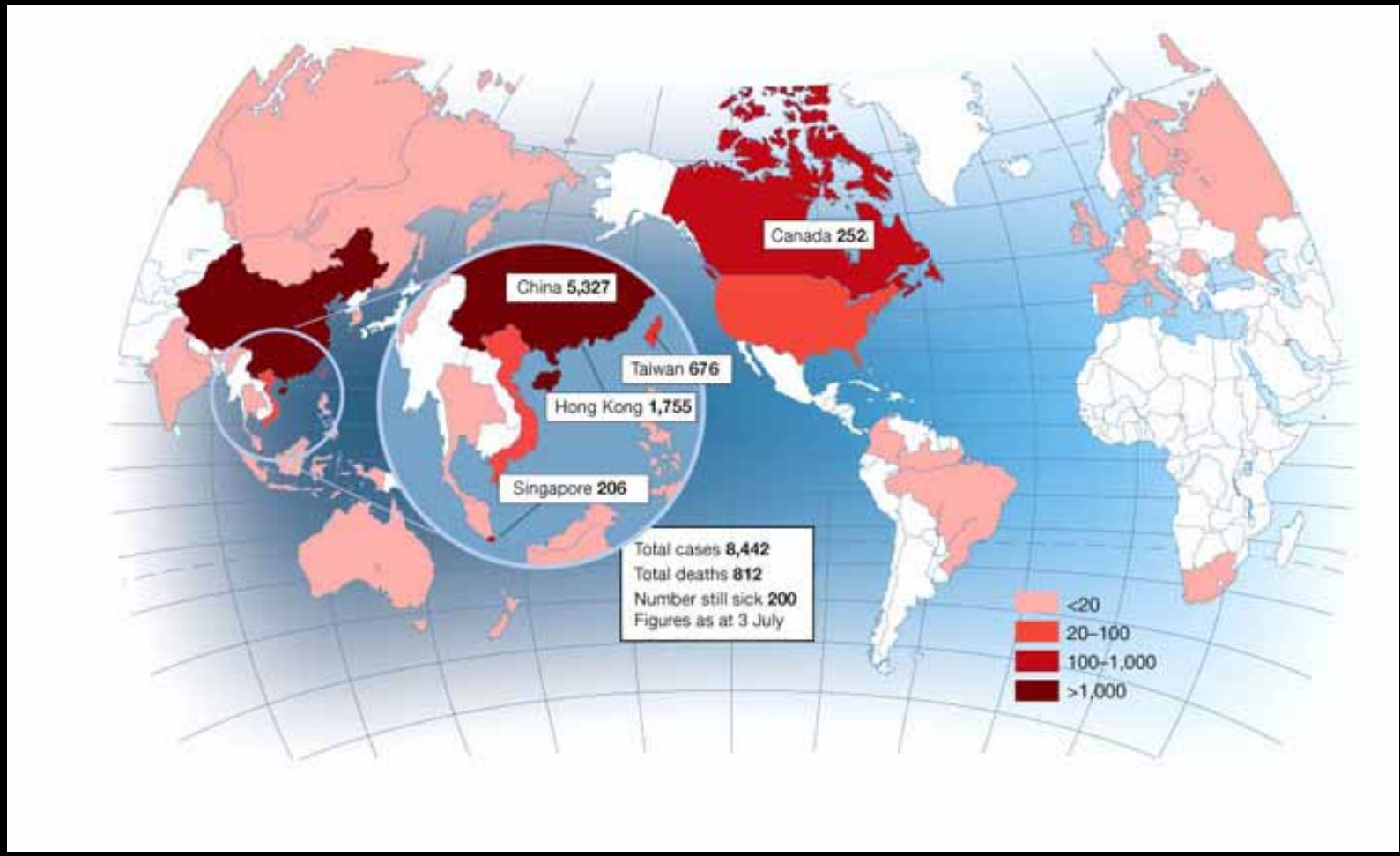
As of July 8, 2003, there have been 35 laboratory-confirmed cases of monkeypox in people in the United States, and about another three dozen suspect and probable cases under investigation, in Illinois, Indiana, Kansas, Ohio, Missouri, and Wisconsin (Ref. 4). As of July 11, 2003, 16 persons were reported to have been hospitalized; however, some of these hospitalizations were for isolation purposes unrelated to illness. Among those hospitalized, two were children who required intensive care, one for severe monkeypox-associated encephalitis (encephalitis is an inflammation of the brain), and one with profound painful cervical and tonsillar adenopathy (adenopathy refers to an enlargement of the glands) and diffuse pox lesions, including lesions in the oropharynx. Both children recovered from their illness.

In the United States, individuals apparently began contracting monkeypox in early May, 2003, primarily as a result of contact with prairie dogs that had contracted monkeypox from diseased African rodents. Investigations indicate that a Texas animal distributor imported a shipment of approximately 800 small mammals from Ghana on April 9, 2003, and that shipment contained 762 African rodents, including rope squirrels (*Funisciurus sp.*), tree squirrels (*Heliosciurus sp.*), Gambian giant pouched rats (*Cricetomys sp.*), brushtail porcupines (*Atherurus sp.*), dormice (*Graphiurus sp.*), and striped mice (*Hybomys sp.*). Some animals were infected with monkeypox, and CDC laboratory testing confirmed the presence of monkeypox in several rodent species, including one Gambian giant pouched rat, three dormice, and two rope squirrels (Ref. 4). Of the 762 rodents from the original shipment, 584 have been traced to distributors in six states. A total of 178 African rodents could not be traced beyond the point of entry in Texas because records were not available (Ref. 4). The number of animals traced may change as the investigation continues.

II. What Actions Have Been Taken to Prevent the Spread of Monkeypox?

Non-native animal species, such as the African rodents, can create serious public health problems when they introduce a new disease, such as monkeypox, to the native animal and human populations. The transportation, sale, or distribution of an infected animal, or the release of an infected animal into the environment can result in the further spread of disease to other animal species and to humans.

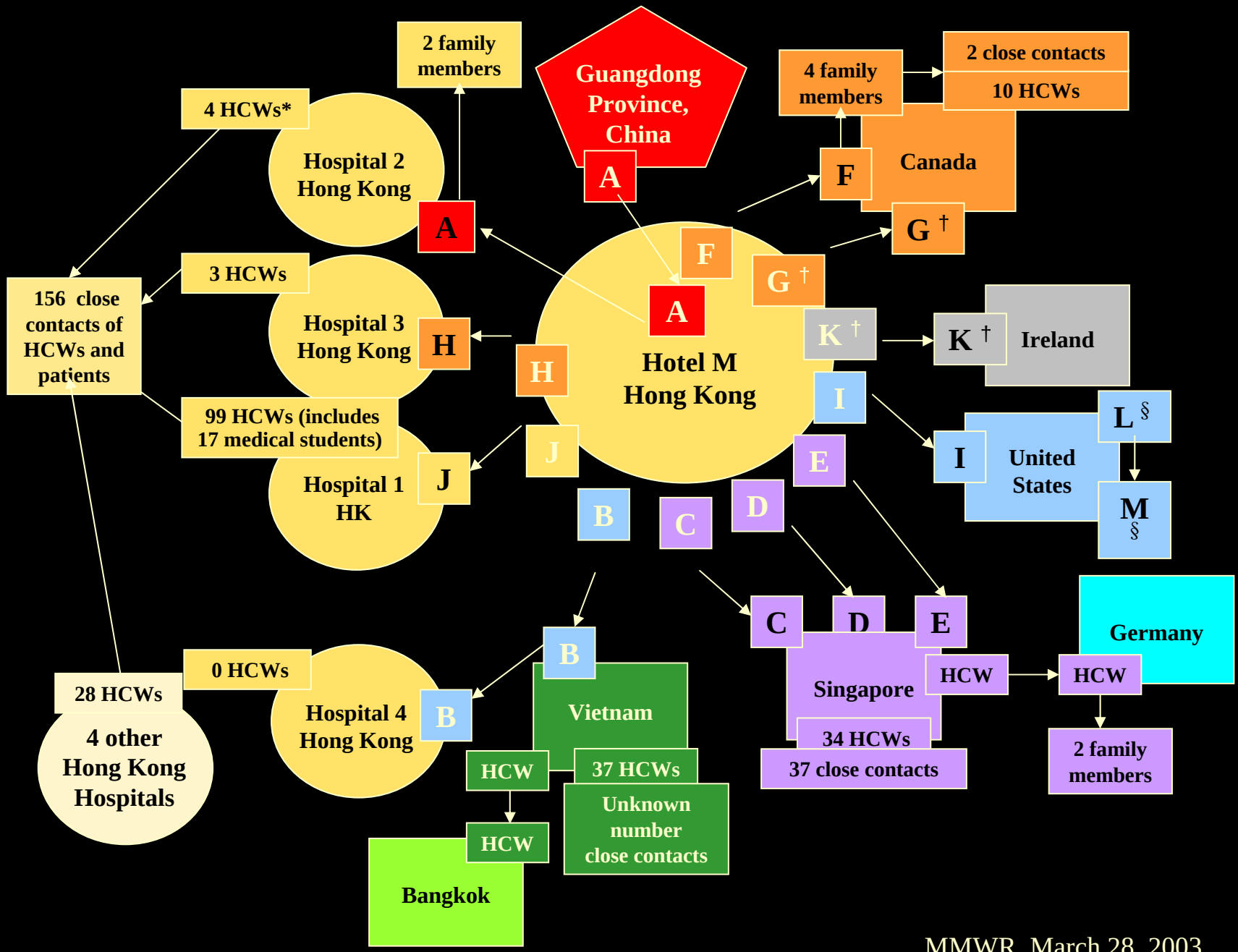
Several States have issued orders or emergency rules to prohibit the



Number of countries	29
Countries w/local transmission	9
Number of Health Care Workers	1707 (21%)

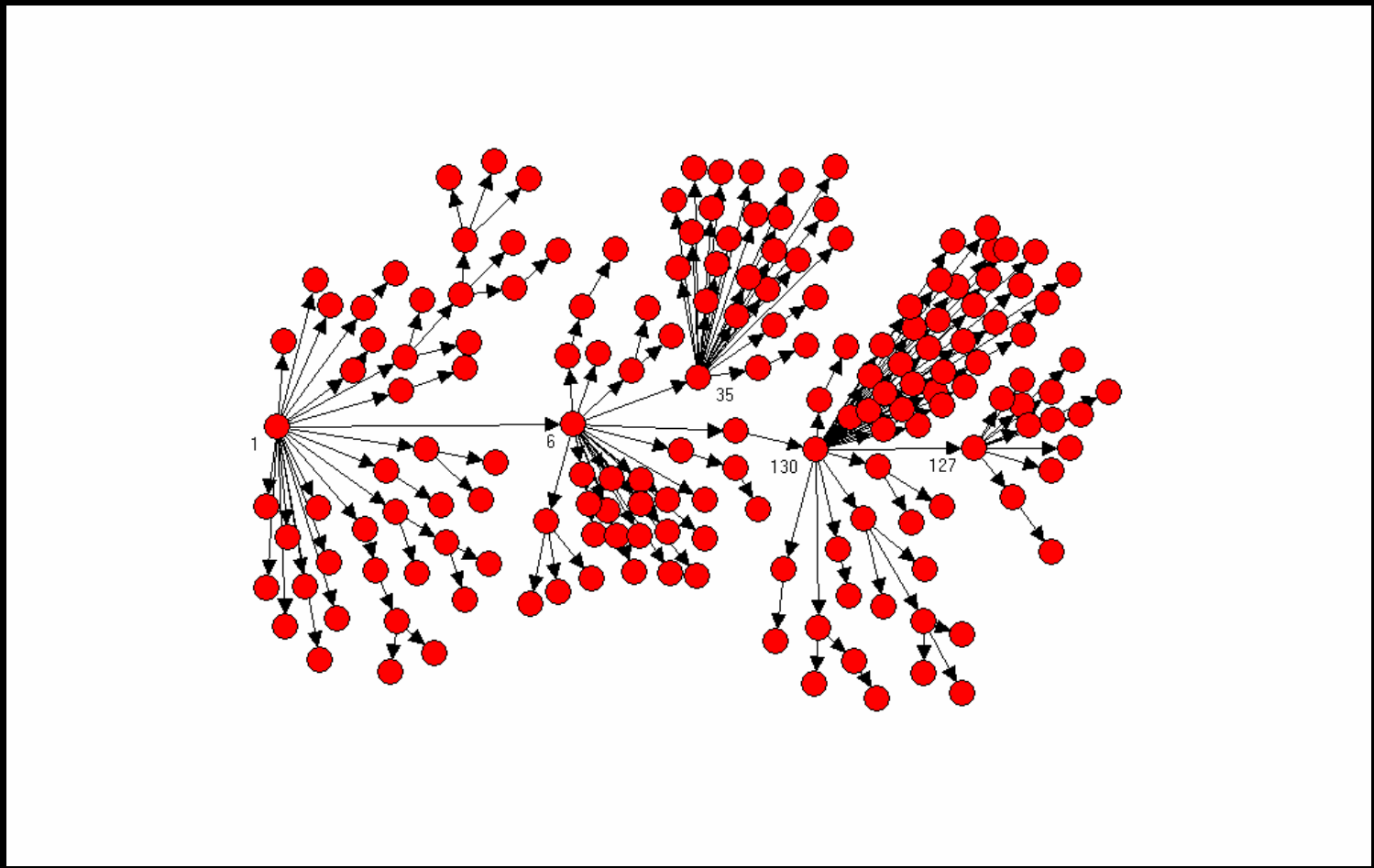
March 13, 2003

Chain of transmission among guests at Hotel M—Hong Kong, 2003



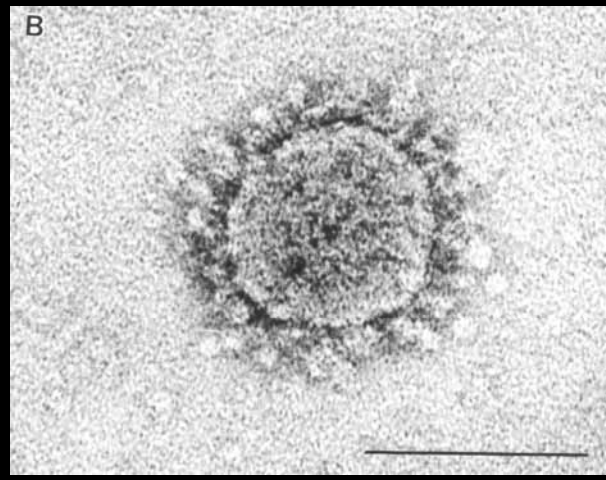
MMWR. March 28, 2003

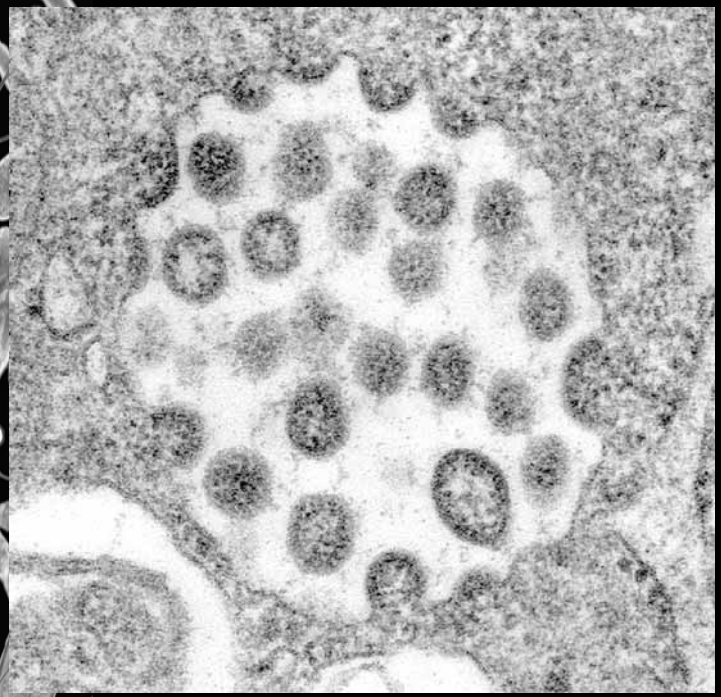
Probable cases of SARS by reported source of infection*--
Singapore, February 25 – April 30, 2003

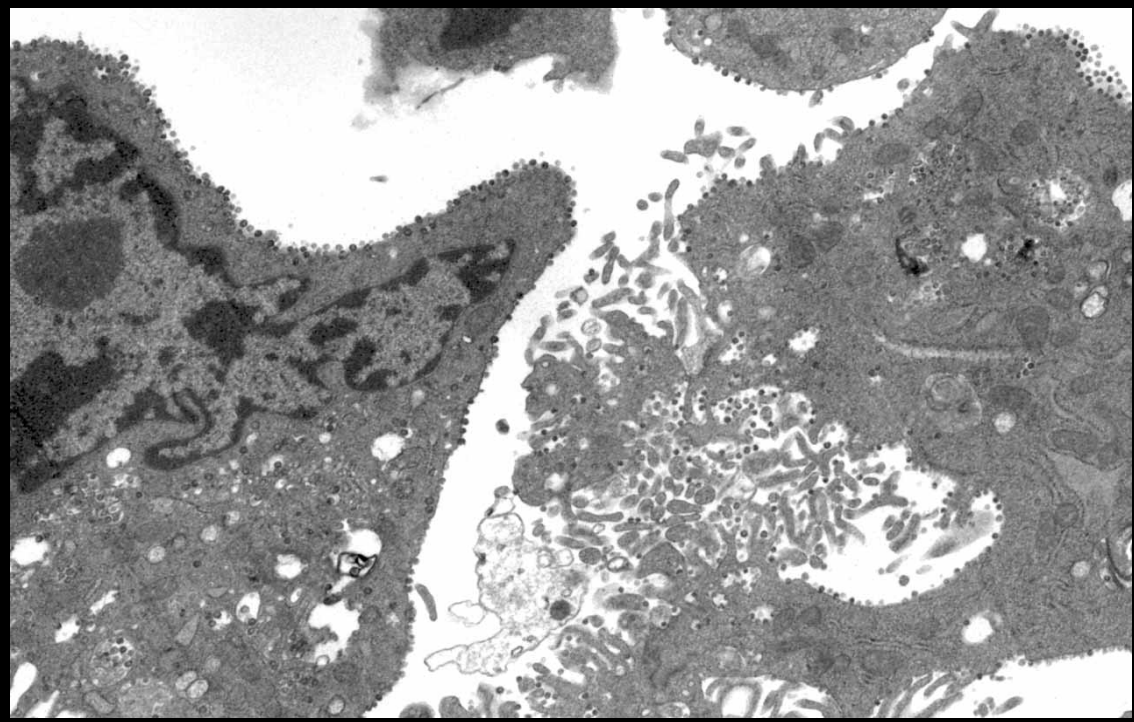


* N= 173

SARS-CoV isolate

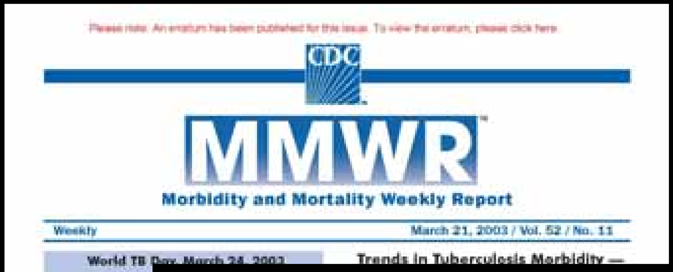






City Disinfection, Taiwan

djernigan@cdc.gov


Please note: An erratum has been published for this issue. To view the erratum, please click here.

CDC

MMWR

Morbidity and Mortality Weekly Report

Weekly — March 21, 2003 / Vol. 52 / No. 11

World TB Day, March 24, 2003

Trends in Tuberculosis Morbidity —


226 — MMWR — March 21, 2003

Outbreak of Severe Acute Respiratory Syndrome —Worldwide, 2003

Since late February 2003, CDC has been supporting the World Health Organization (WHO) in the investigation of a multicountry outbreak of atypical pneumonia of unknown etiology. The illness is being referred to as severe acute respiratory syndrome (SARS). This report describes the scope of the outbreak, preliminary case definition, and interim infection control guidance for the United States.

TABLE. Number of suspected and probable cases and deaths from severe acute respiratory syndrome, by location—Worldwide, 2003*

BOX. CDC preliminary case definition for severe acute respiratory syndrome (SARS)*


2003, 78, 81–88 — No. 12

Weekly epidemiological record
Relevé épidémiologique hebdomadaire

21 MARCH 2003, 78th YEAR / 21 MARS 2003, 78e ANNÉE
No. 12, 2003, 78, 81–88
http://www.who.int/wer

Contents

Sommaire

WORLD HEALTH ORGANIZATION Geneva

ORGANISATION MONDIALE DE LA SANTÉ Genève

OUTBREAK NEWS

Severe acute respiratory syndrome (SARS)

The World Health Organization is currently coordinating a global response to reported outbreaks of severe acute respiratory syndrome (SARS), an atypical pneumonia of unknown etiology. Cases have been reported from eight countries since February 2003. As of 19 March 2003, 264 suspect and probable cases of SARS (including 9 deaths) have been reported to WHO.

Clinical and epidemiological update

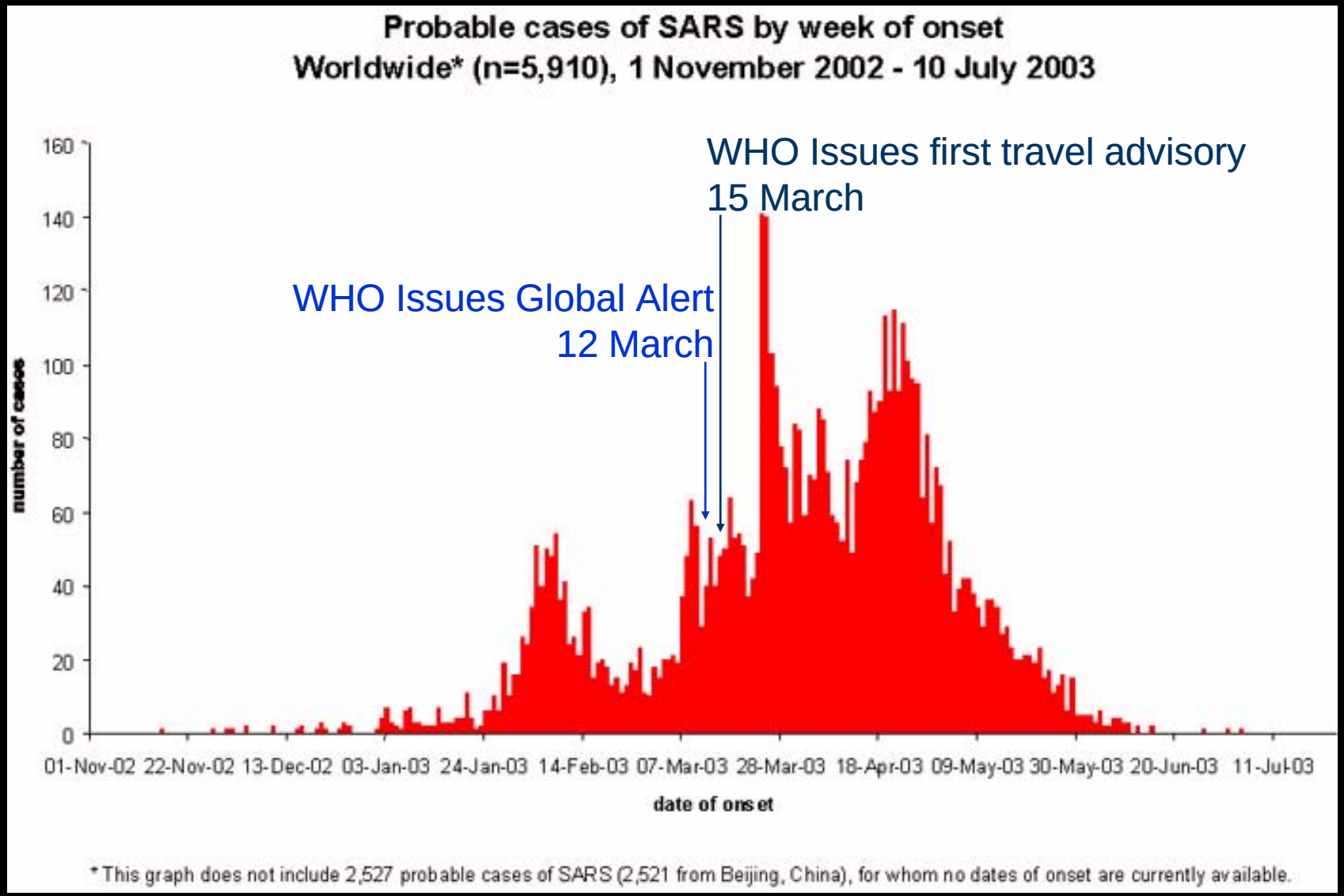
SARS was first recognized at the end of February 2003 in Hanoi, Viet Nam. The index

LE POINT SUR LES ÉPIDÉMIES

Syndrome respiratoire aigu sévère (SRAS)

Mise à jour des données cliniques et épidémiologiques

81

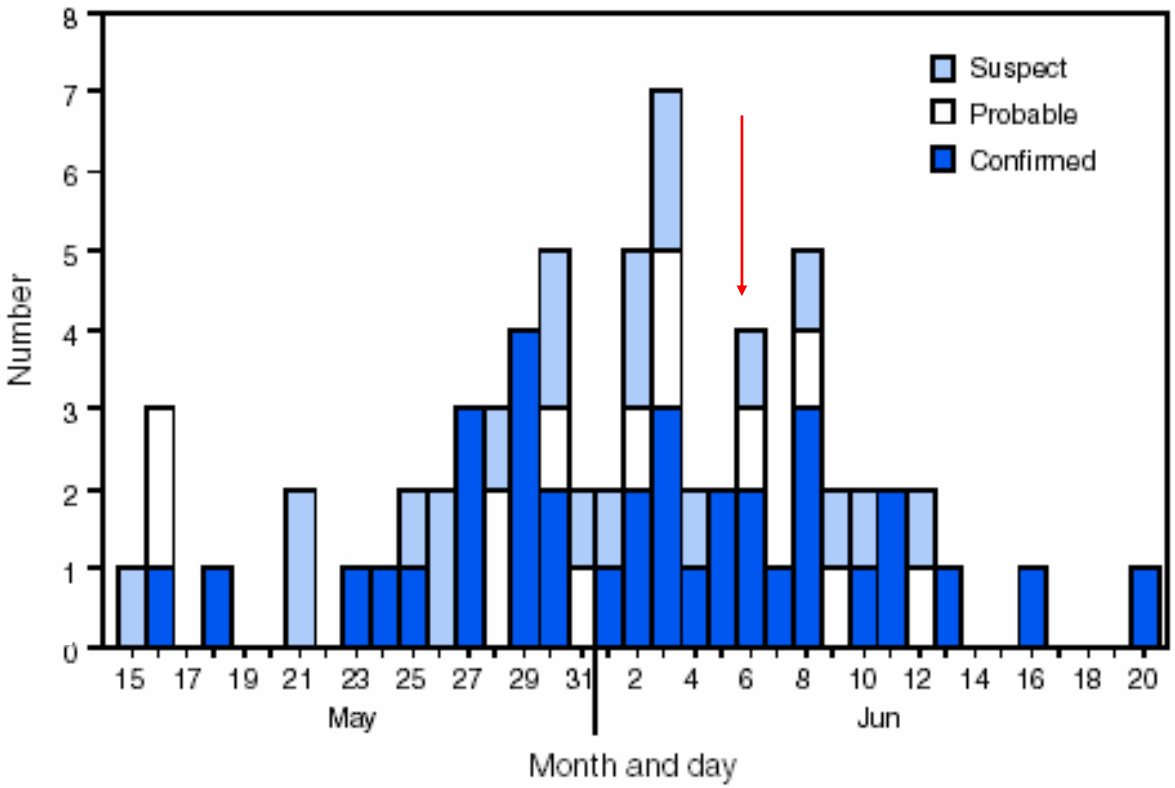


Adapted from the SARS WHO Epidemic Curves
[http://www.who.int/csr/sars/epicurve/epiindex/en/index1.html]

April 9
African Shipment
Arrives

April 21
Purchased by
Illinois Shop

FIGURE 1. Number of monkeypox cases*, by date of illness onset — Illinois, Indiana, Kansas, Missouri, Ohio, and Wisconsin, 2003†



* N = 69 of 71 cases with known date of illness onset.
† As of July 8, 2003.

Nipah Outbreak Chronology尼派毒病爆发历史

Nov 98 -Suspected outbreak of Japanese encephalitis (JE) in pig farmers in Ipoh
在Ipoh的养猪场爆发疑似日本脑炎

-Unusual disease in pigs一种不常见的猪病

Dec 98 -JE vaccination of humans, pigs considered

曾考虑用人患日本脑炎疫苗治疗该种猪病

-Mosquito fogging 并使用灭蚊剂

Dec 98- Jan 99 -Pigs moved to Sikamat and Bukit Pelandok
人们把猪转移到Sikamat和Bukit Pelandok 两地

Feb 99- Disease appears in Bukit Pelandok

疾病在Bukit Pelandok 出现了

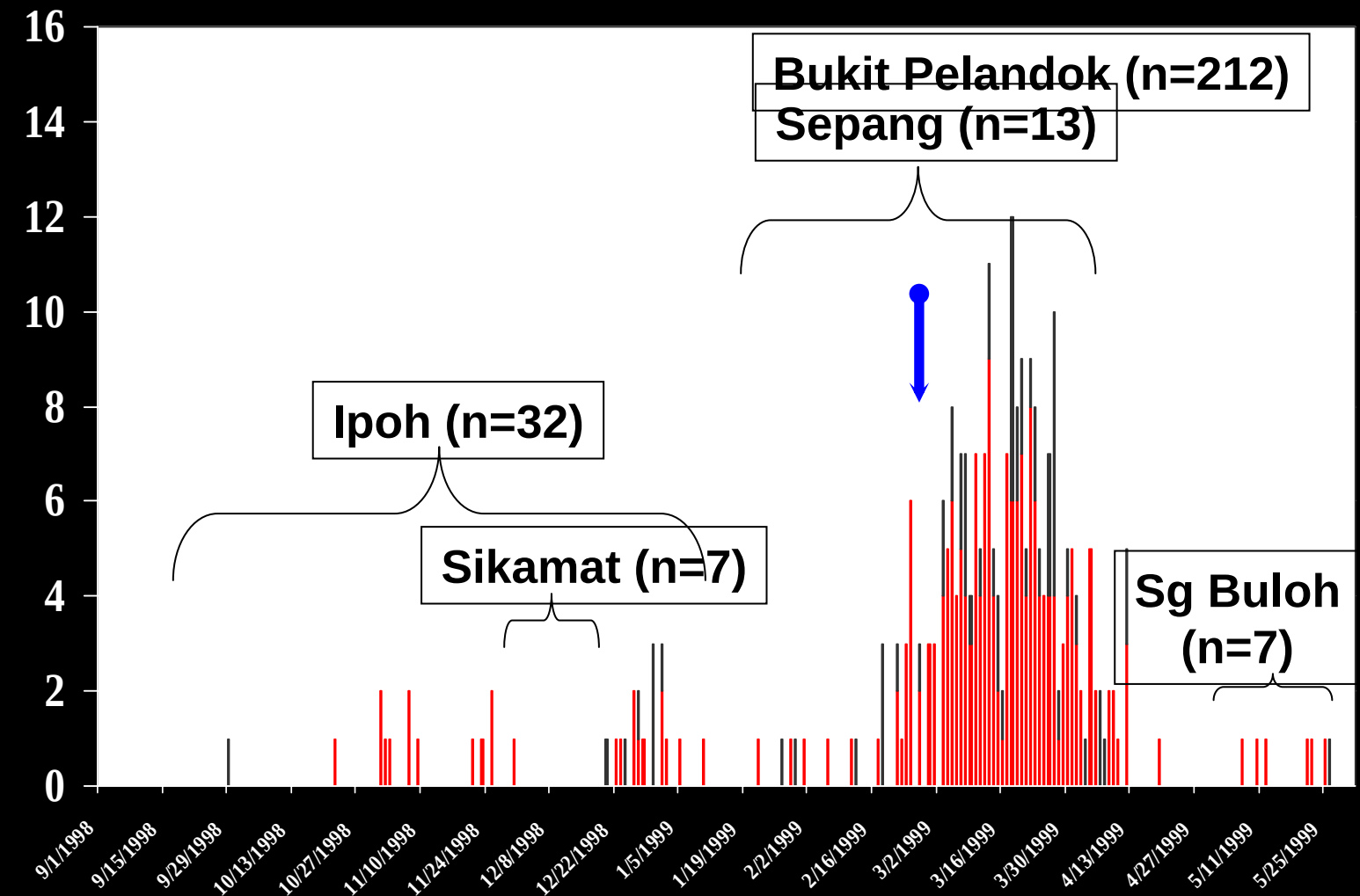
Mar 99 - Residents in Bukit Pelandok flee villages

人们不得不离开Bukit Pelandok 的村庄

- Nipah virus diagnosis

确诊为尼派病毒。

Outbreak Epidemic Curve



Avian Influenza

"We must never take for granted the precious gift of hindsight."

Improving Preparedness and Response:

Lessons Learned from Recent Outbreaks

改善准备工作和应对措施：从最近的疾病爆发吸取的经验

- Increased resources for All Surveillance and laboratory activities为监测和实验室工作增加资源
- Transparency & Political Will增加透明度和政策的主动性
- Multi-disciplinary partners多学科的合作
- Proactive communications主动交流信息
- Increased research, training, and Education加强研究，培训和教育
- Integration of human and animal health 人类和动物健康的整和

Future: Implementation of global zoonotic monitoring system
未来：全球人畜共患病监测系统的实施

- Integrate with public health surveillance—nationally and internationally同各国和国际的公共健康监测相结合
- Identify gaps in public health and animal surveillance确定公共健康和动物检测中存在的问题
- Identify political barriers确定政策障碍
- Develop and distribute diagnostic tests for rapid and sensitive screening发展并推广快速和灵敏筛选的诊断方法
- Encourage agencies to study underlying mechanisms of disease emergence鼓励机构研究疾病爆发机制

From T. Kuiken, et al., Science, 9 Sept 2005

Think globally, act locally
行动全球化，行动地方化

- Increase communications between public health and animal health authorities增加公共健康和动物健康机构之间的信息交流
- Surveillance of animal health needs to be a part of public health surveillance对动物健康的监测应当成为人类健康监测的组成部分
- Just as global organizations are becoming more integrated, so must national and local authorities strive to integrate animal and public health activities正如国际机构间联系日益紧密一样，国家和地方的机构也应当努力将动物和公共健康工作相结合

"What have I got?"