Infectious Disease Control and Public Health – Global Lessons and Collaboration

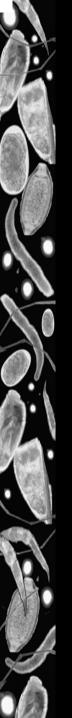
Ali S. Khan, MD, MPH





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

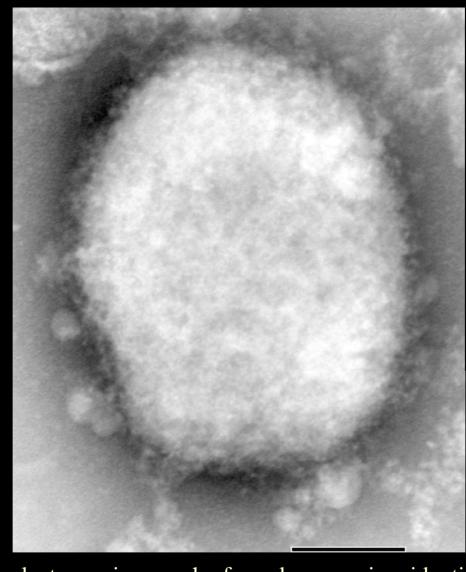
- Animals are thought to be the source of more than 70% of emerging infections (Kuiken, et al., Science 2005)
- Often a disconnect between agencies monitoring the health of animals and public health agencies



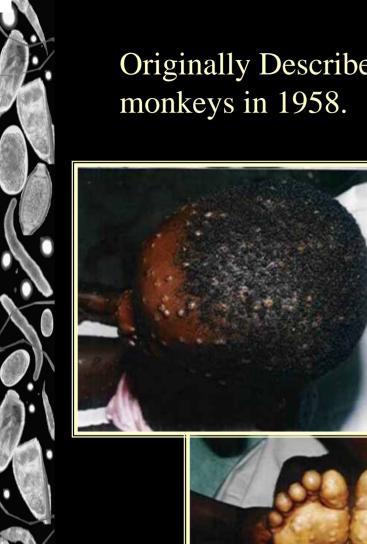
By Jeff Stahler, The Cincinnati Post, for USA TODAY, June 11

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



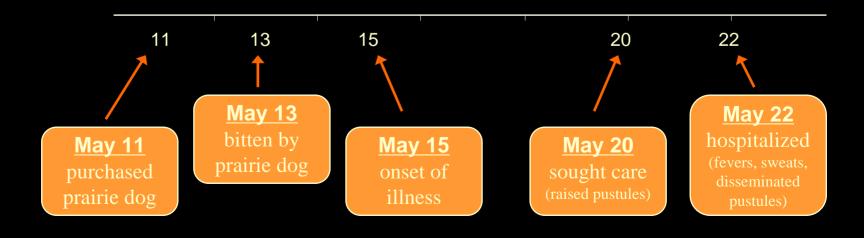


Monkeypox index case, USA, May 2003

Marshfield Clinic, WI -- Kurt Reed and colleagues







Prairie Dogs



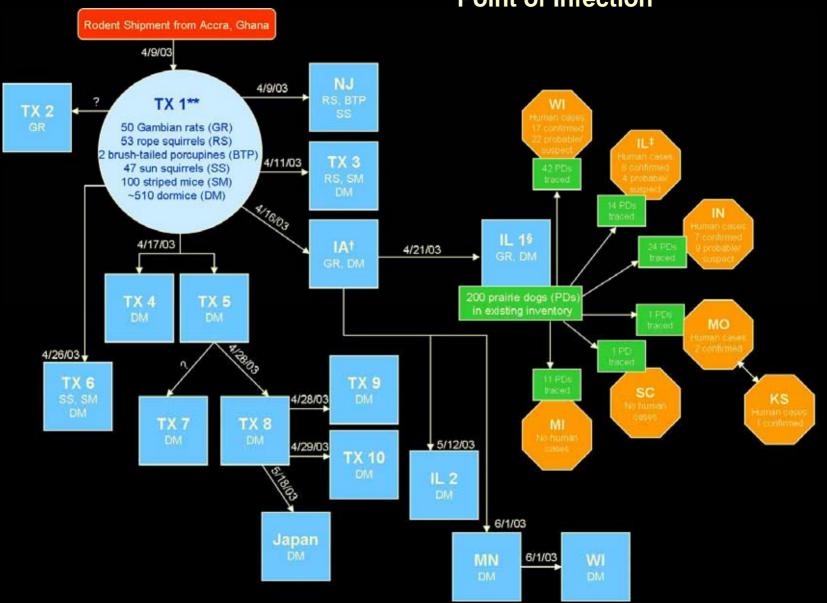
Gunnison's prairie dog *C. gunnisoni*



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





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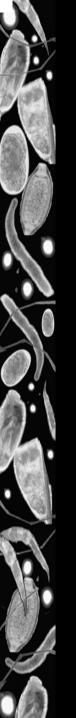
Monkeypox Report of Cases in the United States

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

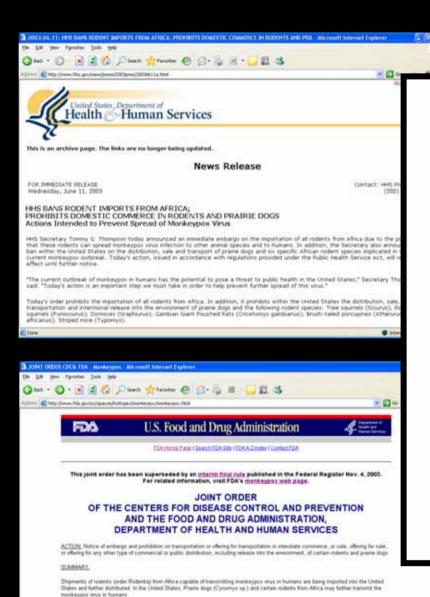
For more information, visit the CDC Monkeypox web site.

(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



Because of the public health threat goved by the importation of rodents from Aniva. CDC is implementing an introducte emburge on the importation of all notices intrine Rodential from Alica until Author votice. In addition, as a public health measure, CDC and EDA are probabilitied, until further notice, the transportation or offering for inapportation in interestation continues, or the sale or offering for sale, or offering to any other type of commercial or public distribution, including release sits the environment, of Present dops and the following conducts from Alica: Their appoints the Millimications is XI. Specia squired if Provincians (as). Deminist properties are all continues and the second of the Continues (Carel Provincians Special Specia

Ratz (Cricetomys sp.); Enuth-tailed porcupines (Athenaus sp.), Striped Inice (Hybornys sp.).

36566 Federal Register/Vol. 68, No. 117/Wednesday, June 18, 2003/Notices

Têle	Number of respondents	Number of responses/ respondent	Burden per response (in hrs.)	Total burden (hrs.)
Total				67,281

Dated: June 12, 2003.

Thomas A. Bartenfeld,

Acting Associate Director for Policy, Planning and Evaluation, Centers for Disease Control and Prevention.

IFR Doc. 03-15330 Filed 6-17-03; 8:45 am BILING CODE 4183-18-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention

Food and Drug Administration

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

SUMMAY: Shipments of rodents (order. Rodentis) from Africa capable for transmitting monkeypox virus in humans are being imported into the Unified States and further distributed, the United States, Prairie dogs (Gymony se) and cortain rodents from Africa may further transmit the monkeypox virus in humans.

Because of the public health threat from Africa. CDC is implementing at immediate embargo on the importation of all rodents (order Rodentie) from Africa until further notice. In addition as a public health measure. CDC and FDA are prohibiting, until further notice, the transportation or offering transportation in interstate comm or the sale or offering for sale, or offering for any other type of commercial or public distribution. including release into the environn of Prairie dogs and the following rodents from Africa: Tree souirrels (Heliosciurus sp.); Rope squirrels (Funisciurus sp.): Dormices (Graph sp.); Gambian Giant Pouched Rats (Cricetomys sp.); Brush-tailed

porcupines (Atherurus sp.), Striped mice (Hybomys sp.).

This prohibition does not apply to

involved in the outbreak will likely change as the investigation continues. Onset of illness among patients began

62353

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 earth week.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Parts 16 and 1240

[Docket No. 2003N-0400]

Centers for Disease Control and

40 OFF D-4 74

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.

SUMBAY: The Cutters for Disease Control and Prevention (CICC) and the Food and Drug Administration (FDA) are issuing this interin final rule to amend their regulations to establish new restrictions and modify existing restrictions on the import, capture, distribution, and release of African rodents, prairie dogs, and certain other animals. We are taking this action prevent the spread of monkeypex, a communicable disease, in the United

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 Dreg Administration, 5630 Fishers Lane, rm. 1901, Rockelle, 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, 1000 Clifton Rd., MS E11, Atlanta, GA 30333. Comments on the rule itself should be sent to FDA's Division of Dockets Management (See

FOR FURTHER INFORMATION CONTACT:

FDA addresses)

For information requaring 1DA: Phillip L Chao, Office of Polity and Planning (HF-23), Food and Drug Administration, 5000 Fishers Lane. Rockville, MD 20057, 201–207–2057.

Rockville, MD 20057, 201–207–2057.

Barrow, National Center for Infectious Districts. Centers for the Infectious Districts of Centers for Infectional Center for Infectional Centers for Infection Centers for Infe

SUPPLEMENTARY INFORMATION:

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

Monkeypex is a rare, zoonotic, viral disease bate occurs primarily in the tain forest countries in central and west Adrica. (A zoonotic disease is a disease of a nimals that can be transmitted to the countries of primates, rodents, and lagomorphy (which includes such as the countries of the cou

In humans, morkeypex is marked by rashes that are similar to those seem in small pox; other signs and symptoms include a temperature at or above 90.3 degrees, chills and/or sweats, headachs, buckache, lymphademopathy of disease of the lymph nodes), sore throat, cough, and shortness of breath (Ref. 2). The approximately 12 days (Ref. 3), In Africa, moskeypex 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 Illicois, Indiana, Kansas, Ohio, Missouri, and Wisconsin (Ref. 4). As of July 11, 2003, 16 persons

were reported to have been loopfullated, however, came of these hospital levels however, came of these hospital levels however, came of these hospital levels were for isolation purposes unrelated to tillness. Among those hospitalities were children who required intensive were children who required intensive sero, can for severe menkeypers, care, can for severe menkeypers, with profound pointed certification and to small and and to small and and to small and enoughty (adenopably refers to an enlargement of the glands) and the orephayne. Both children issues in recovered from their illness.

In the United States, individuals apparently began contracting monkeypox in early May, 2003 primarily as a result of contact with airie 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 (Funiscuirus sp.), tree squirrels squirreis (runiscurus sp.), tree squirreis (Helioschurus sp.), Gambian giant pouched rats (Cricetourys sp.), brushtail porcupines (Atherurus sp.), dormice (Graphhurus sp.), and striped mice (Graphanus sp.), and striped mice (Hybouny 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 dormics, and rope squirrels (Ref. 4). Of the 762 rodents from the original shipment, 584 have been traced to distributors in six states. A total of 176 African rodents could not be traced beyond the point of entry in Texas because records were not available (Ref. 4). The number of snimals traced may change as the investigation continues

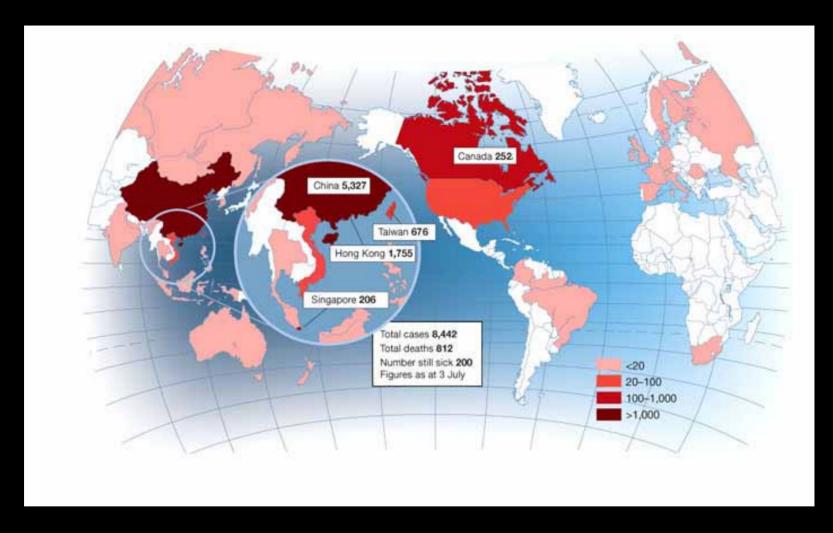
II. What Actions Have Been Taken to Prevent the Spread of Monkeypox?

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

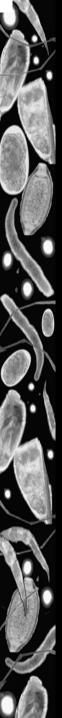
Several States have issued orders o emergency rules to prohibit the

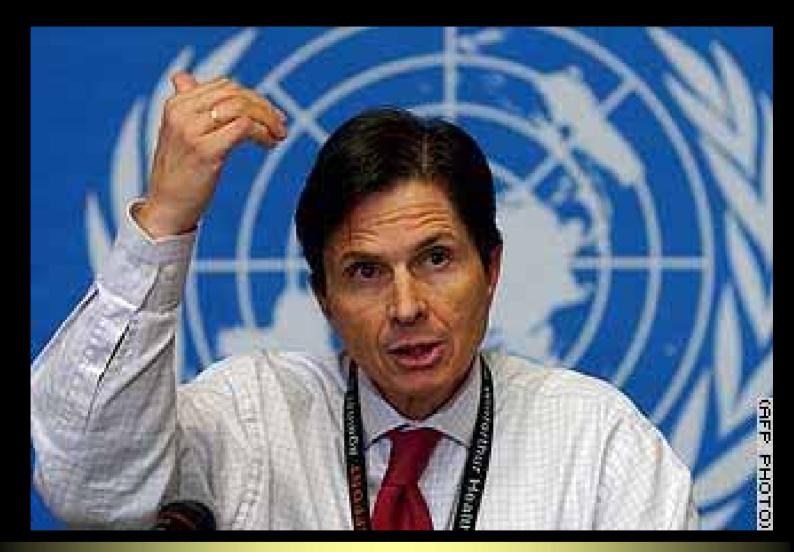
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Discret



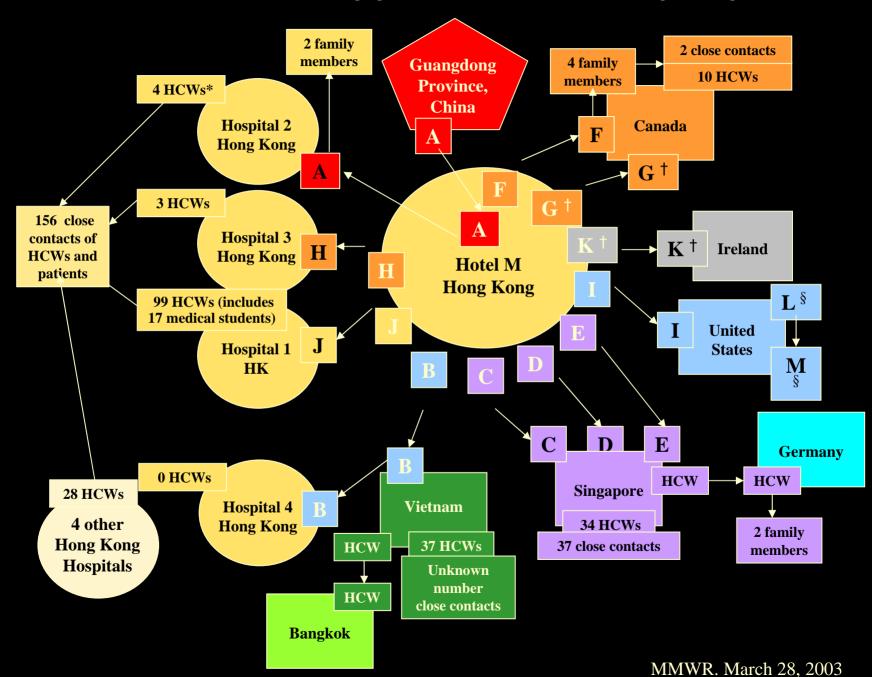
Number of countries	29
Countries w/local transmission	9
Number of Health Care Workers	1707 (21%)



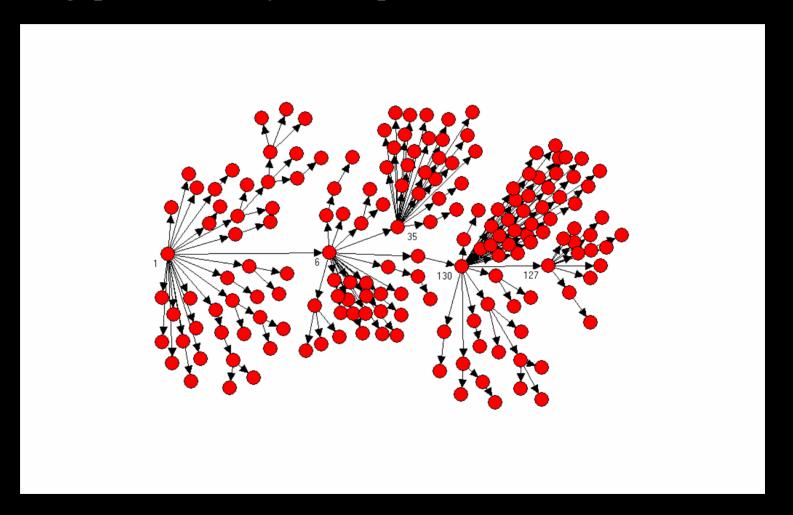


March 13, 2003

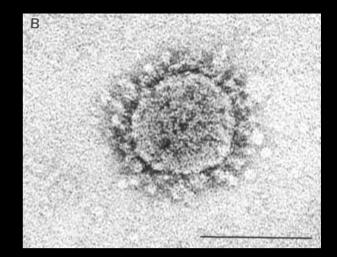
Chain of transmission among guests at Hotel M—Hong Kong, 2003

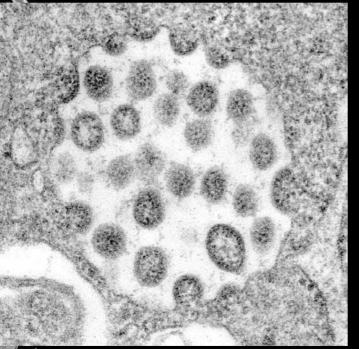


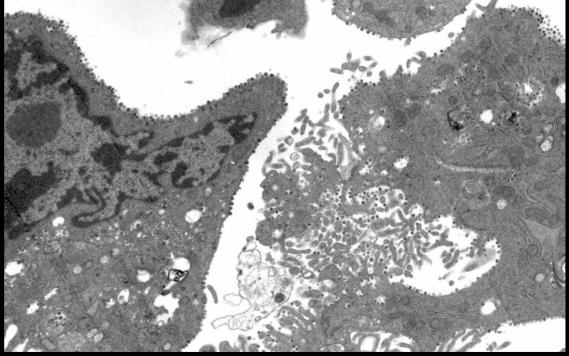
Probable cases of SARS by reported source of infection*--Singapore, February 25 – April 30, 2003



SARS-CoV isolate









Please rists: An engiture has been published for this issue. To view the arratum, please click here.



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

World TB Day, March 24, 2003

Trends in Tuberculesis Merbidity -

Winds THE Day of the Acres in 1887 w server of the subset halog come of c world's popularie camp TB, and are pear from TB. After 1985-1982. The east, and Acrelo manage in the 10 de diseas. Prints

is the Debut Sun CDC is committee the United States 1 he posible withat highest risk for gles to improve to microbations Our A be terminibilities parisons who have Other offsets inch log to the photol of that though World --- Alia 2009/Ada

Outbreak of Severe Acute Respiratory Syndrome -- Worldwide, 2003

Since late February 2005, CDC has been supporting the World Health Organization (WHO) in the investigation of a multicountry codorols of atypical poromonia of unknown enalogy. The iffered is being referred to as severe across resulpriory produces (SARN). This proper describes the array of the audienals, preliminary case deliatricas, and insertes todaytion control guidance for the United States.

On February 11, the Chinese Ministry of Health notified WHO that 305 cases of acute respiratory syndrome of unknown etiology had occurred in six municipalities in Guangdong province in southern China during November 16, 2002-February 9, 2003. The disease was characterized by transmission to health-care workers and household contacts: five deaths were reported (J). On February 26, a man aged 47 years who had traveled in mainland China and Hong Kong became ill with a respiratory illness and was hospitalized shortly after arriving in Hanoi, Vietnam. Health-case providers at the hospital in Hanoi subsequently developed a similar illness. The patient died on March 13 after transfer to an isolation facility in Hong Kong, During late February, an outbreak of a similar respiratory illness was reported in Hong Kong among workers at another hospital: this cluster was linked to a patient whe had marshed previously to neadure. China. On March 12, WHO issued a global alors about the outlessk and instrumed markbasile sermillines.

Acof March 19, WHO loss morbed assures of 264 augtons from LL countries with suspected and probable? NARS (Table). Array with mastered local transmission include Hong Kingand Guangloog province. China: Hansi, Vietnam: and "Supremal cases (Dire) with ceilers of pulsaryagine evaluate of processors or

and the control of th

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

	54-	Deeme	
Lacuttion		No.	- (%
Hard King	794		- 200
Victorian	14.		- (4)
Gripperon.	31	1.0	-
Cacada		- 2	38
Savier			-
Cermony			
Shalland:	*	1.0	-
Mounte		- 1	-
Lindwid Kingdom			-
Literary Street,	25	- 1	-
Sprint.	+.		-
Total	264		(2)

Singapon. More limited transmission has been reported in Taipet, Taiwan, and Towners, Canada. The initial corereported in Singapore, Taiwan, and Timmers were among peryour who all had meeted to China.

On March 15, after insing a preliminary case definition for supported case (float, CDC initiated enhanced descentisurveillance for SAHS, CDC, also bound a travel advisory expgesting that persons plaining necessarial travel to Hong Kong, Grangdoog, or Hanri consider prosposing their state However, god and other bear, may you multi hind On March 16, CDC began advising passengers arriving on diseas flicker from these three locations to seek medical attention if they have symptoms of febrile respiratory illness. As of March 18, approximately 12,000 advisory notions had been distributed to airline passengers. In addition, surveillance is being heightened for suspected cases of SARS among arriving ngers. As of March 19, a total of 11 suspected cases o SARS in the United States are under investigation by CDC and state health authorities

Among patients reported worldwide as of March 19, the disease has been characterized by rapid onset of high fever, myaleia, chills, rigor, and sore throat, followed by shortness of breath, cough, and radiographic evidence of pneumonia. The incubation period has generally been 3-5 days (range: 2-7 days). Laboratory findings have included thrombocytopehis and bulispenia. Many parisats have had expressing the ness or were parameter registing brogitalisation, and would have required nuclearinal recordation. Of the 204 respectful and probable over represed by WHO, nine (7%) persons have died. In addition, secondary weark same of \$50% have been showed among leadth-our workers caring for patients with

BCX. CDC preliminary case definition for severa acute requirelary symbolses (SARE)*

innery flow of asknown citility with court sino fabruary 1, 2003, and the following criteria-

- Document respective > 101.4°F (+58.0°C)
- . One or more symptoms of respinsory illustrings rough, electrons of breath, difficulty breathing, or radiographic Studiogs of personnels or acute regime tory dianes and one)
- · Close stream? within 10 days of owner of everyone with a present under investigation for ex suspected of having NASS or stand within 12 days of owner of progtomoto as area with the assessed regumination of SAED a defined by the World Health Organisation (WHO)
- thord black (II. 2003). Defend as being tond fin. being lived with, or having leaf deno-cessors with cognitions recommended bads fleak of a present expensed of being \$1,523.

2001 7E ST-SS

Weekly epidemiological record Relevé épidémiologique hebdomadaire

21 MARCH 2003, 78th YEAR / 21 MARS 2003, JP ANNO No. 12 2003 78 ST-SS

38 Performance of acute Baccid paralysis (SFP) sursellance and resterer of potomyellos, 2002-2003 HT beforem

01 Le port sur les épidemes.

— Syndrome respiratione aigui advérir (SRAS)

SEVERE (SEAS)

SE l'oncluorement de la surveillance de la paralysie flanque ague (FAS) et inodence de la poliomyétiz 2002 2003

* 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 atomical measurants of un mown etiology. Cases have been repfrom eight countries since February 2003. As of 19 March 2003, 264 auspect and probable cases of SARS (including 9 deaths) have been reported to WHO Local transmission of SARS has been confirmed in Canada, Hong Kong Special Administrative Region of China (Hong Kong SAR), Singapore, Taiwan (China) and Viet Nam. For latest epidemiological information: http://www.sebo.int/car/sars/en/

In response to requests for assistance, WHO Global Outbreak Alert and Response Network (GDARN) field teams have been deployed in Viet Nam and Hong Kong SAR where they are helping local health authorities to investigate and control the out breaks. WHO is working with Chinese health pical pneunomia that occurred in Guan dong province in November 2002 and peaked in February of this year. WHO is in discussion with health authorities in Sines pore to explore whether international ass tance is required.

supplies of protective and clinical equipment re being made available to affected o In addition, WHO published a travel advisor notice on the 15 March 2003, advising all individuals travelling to affected areas to be watchful for the development of symptoms for a period of 10 days after returning.

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)

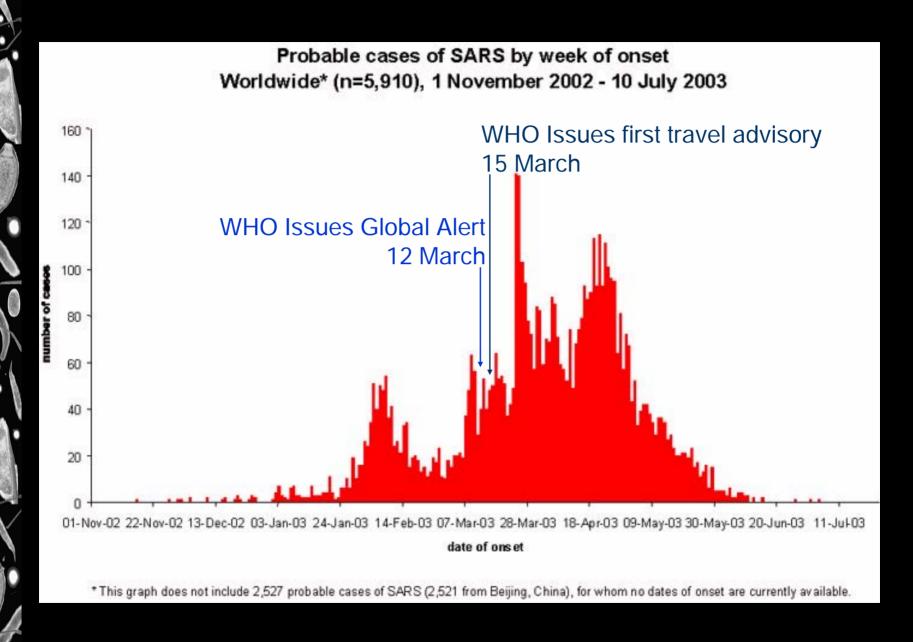
L'Organisation mondiale de la Santé s'occupe actuellement de coordonner la riposte interna-tionale face aux flambées de syndrome respiratoire eieu sévère (SRAS), une mesumonie atymique d'étiologie encore inconnue. Des cas ont été notifiés par 8 pays depuis février 2003. Au 19 mars 2003, 264 cas suspects ou probables de ce syndro-me (dont 9 mortels) avaient été notifiés à l'OMS. La transmission locale du syndrome a été confir née au Canada, à Hong Kong, Région adminis trative spéciale de la Chine (RAS), à Singapour, à Talwan (Chine) et au Viet Nam. Les information ologiques les plus récentes peuvent être consultées sur: http://www.who.int/car/sars/en/.

Afin de répondre aux demandes d'assistance, des équipes de terrain du Réseau mondial OMS d'alerte et d'action en cas d'épidémie (GOARN) ont été déployées au Viet Nam et à Hong Kung RAS pour aider les autorités sanitaires locales à mener les investigations nécessaires et à lutter contre les flambées. L'OMS enquête aussi avec les autorités chinoises sur une flambée de pneumo-nie atypique survenue en novembre 2002 dans la province de Guandong, laquelle a atteint un pic en sévrier de cette année. L'Organisation étudie actuellement avec les autorités sanitaires de Singapour la nécessité éventuelle d'une aide inter

L'OMS a installé des bases logistiques et mis à le disposition des pays affectés des stocks de matériel de protection et d'équipement clinique. Le 15 mars dernier, l'OMS a publié un avertissement aux voyageurs conseillant à toute personne se rendant dans les régions touchées d'être attentive à l'apparition de symptômes dans les 16 jours

Mise à jour des données cliniques et épidémiologiques

Le syndrome a été reconnu pour la première fois en février 2003 à Hanoi, Viet Nam. Le cas indica-

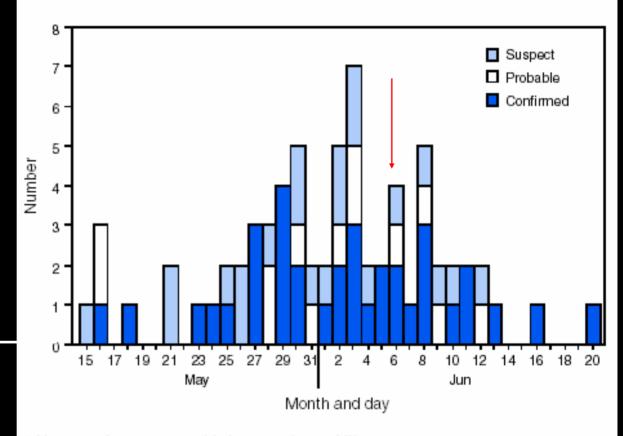


Adapted from the SARS WHO Epidemic Curves [http://www.who.int/csr/sars/epicurve/epiindex/en/index1.html]

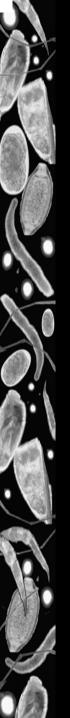
April 9
African Shipment
Arrives

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

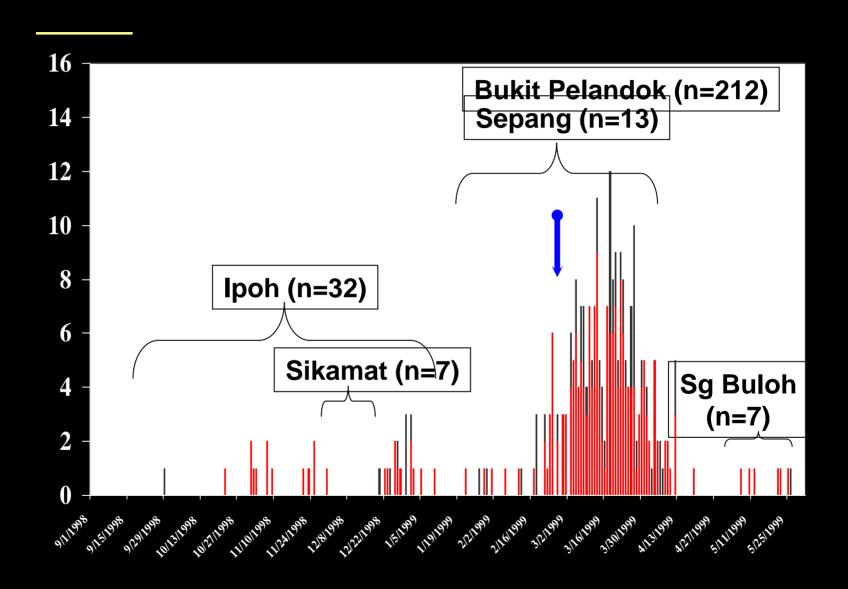
人们不得不离开Bukit Pelandok 的村庄

- Nipah virus diagnosis

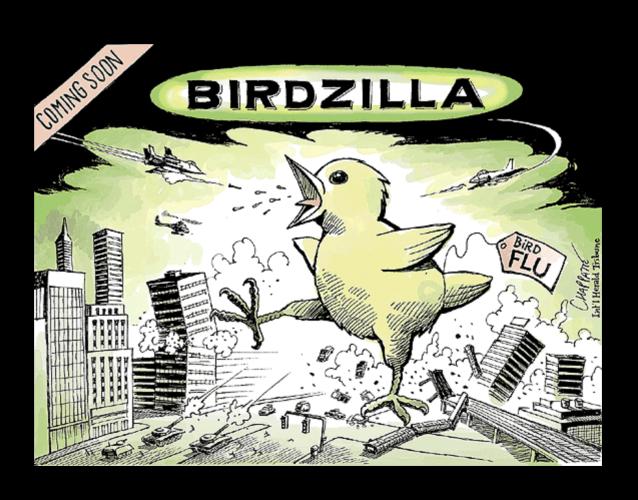
确诊为尼派病毒。



Outbreak Epidemic Curve

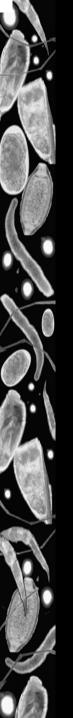


Avian Influenza





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

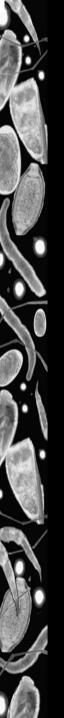


Improving Preparedness and Response:

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

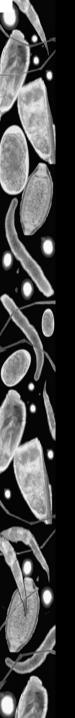
- Increased resources for All Surveillance and laboratory activities为监测和实验室工作增加资源
- Transparency & Political Will增加透明度和政策的主动性
- Multi-disciplinary partners多学科的合作
- Proactive communications主动交流信息
- Increased research, training, and Education加强研究,培训和教育
- Integration of human and animal health 人类和动物健康的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



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



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?"