

ProMED: Monitoring Emerging Disease Outbreaks Through Unofficial Sources

Dr. Larry Madoff, Harvard Medical School, Editor, ProMED Mail


A Webber Training Teleclass


Monitoring Emerging Disease
Outbreaks Through Unofficial Sources

Larry Madoff, MD
Editor, ProMED-mail:
The Program for Monitoring Emerging Diseases


Hosted by Paul Webber
paul@webbertraining.com

www.webbertraining.com






1992




2003

“Microbes are ranked among the most numerous and diverse of organisms on the planet; pathogenic microbes can be resilient, dangerous foes. Although it is impossible to predict their individual emergence in time and place, we can be confident that new microbial disease will emerge.”

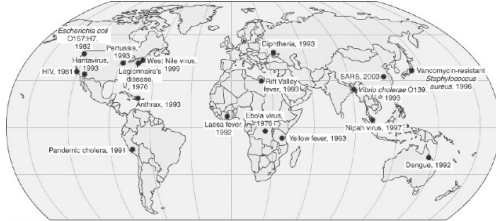
-Institute of Medicine, 1992



CDC definition: An Emerging Disease is one whose incidence in humans has increased within the past two decades or threatens to increase in the near future






Examples of emerging diseases




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Map of the world showing examples of geographic locales where infectious diseases were noted to have emerged or resurged.

Adapted from "Addressing Emerging Infectious Disease Threats: A Prevention Strategy for the United States," Department of Health and Human Services, Centers for Disease Control and Prevention, 2004.

A tale of two emerging diseases

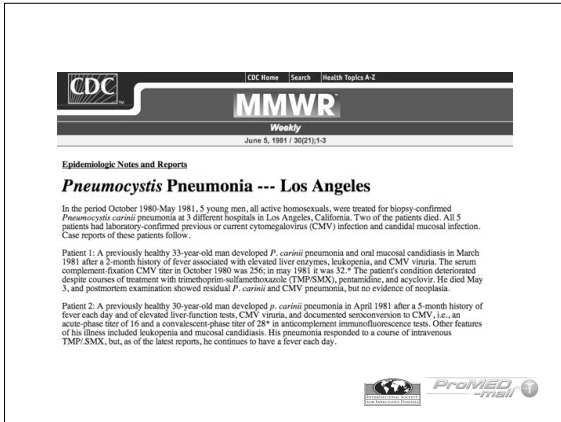


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The screenshot shows the ProMED-mail website interface. At the top, there is a navigation bar with 'CDC Home', 'Search', and 'Health Topics A-Z'. Below this is the 'MMWR Weekly' logo, dated 'June 5, 1981 / 30(21):1-3'. The main content area features the heading 'Epidemiologic Notes and Reports' followed by 'Pneumocystis Pneumonia --- Los Angeles'. The text below describes a case report from October 1980 to May 1981 involving five young men in Los Angeles, California, who were treated for biopsy-confirmed *Pneumocystis carinii* pneumonia at three different hospitals. Two of the patients died. The article mentions laboratory-confirmed previous or current cytomegalovirus (CMV) infection and candidal mucosal infection. It also includes details about two patients: Patient 1, a 33-year-old man who developed *P. carinii* pneumonia and oral mucosal candidiasis in March 1981, and Patient 2, a 30-year-old man who developed *P. carinii* pneumonia in April 1981. The ProMED-mail logo is visible in the bottom right corner of the screenshot.

Emergence of AIDS


"Most of the available epidemiological data indicate that the extensive spread of HIV started in sub-Saharan Africa in the late 1970s. By the early 1980s, HIV was found in a geographic band stretching from West Africa across to the Indian Ocean, the countries north of the Sahara and those in the southern cone of the continent remained apparently untouched."

A History of AIDS with Emphasis on Africa, UNAIDS & WHO, Sept 2003




Emergence of AIDS


- A plasma sample taken in 1959 from an adult male living in what is now the Democratic Republic of Congo showed HIV
- HIV found in tissue samples from an American teenager who died in St. Louis in 1969
- HIV found in tissue samples from a Norwegian sailor who died around 1976
- Evolutionary model suggests HIV transferred to humans in 1930 +/- 15 years




- Detection of AIDS and discovery of HIV took decades
- What if we had known earlier?



Could information sharing over the Internet and the use of 'informal' or unofficial information sources speed up the detection of emerging diseases?




ProMED founders: Stephen Morse, Jack Woodall, Barbara Hatch Rosenberg in a 1999 photo. (Source: Nature, 432:544,2004.)



About ProMED-mail

- The ProMED-mail electronic outbreak reporting system was inaugurated on the Internet in August 1994 to monitor emerging infectious diseases globally
- Moderated e-mail lists and website
- Free subscription
- 55,000 subscribers in > 170 countries
- All reports are screened by expert Moderators before posting
- Average of 7 reports per day



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Disease Focus

- Plant
food security
- Animal
agriculture, zoonoses
- Human
infectious and acute toxic




PNEUMONIA - CHINA (GUANGDONG): RFI

Date: 10 Feb 2003
From: Stephen O. Cunnion, MD, PhD, MPH
International Consultants in Health, Inc
Member ASTM&H, ISTM

This morning I received this e-mail and then searched your archives and found nothing that pertained to it. Does anyone know anything about this problem?


"Have you heard of an epidemic in Guangzhou? An acquaintance of mine from a teacher's chat room lives there and reports that the hospitals there have been closed and people are dying."



PNEUMONIA - CHINA (GUANGDONG): RFI (2)

Date: 10 Feb 2003
Moderator comment:


[ProMED-mail appreciates the preliminary information above and would be grateful for any additional information. The etiology and extent of this apparent outbreak of pneumonia are unclear, as is whether the outbreak is secondary to influenza. - Mod. LM]



February 11, 2003

- An unidentified pneumonia virus has killed 5 people and left hundreds hospitalized in southern China, while rumors of a surging death toll prompted frightened residents to stock up on antibiotics
- Some 300 people have been hospitalized, one third of them doctors, nurses, and other health workers
- Rumors that hundreds of people had died prompted residents to clear store shelves of antibiotics and pay inflated prices for white vinegar for use as disinfectant, officials said.
- Photos in Hong Kong newspapers showed people in Guangdong wearing surgical masks in hopes of avoiding infection. "The disease is under control. It's not as serious as the rumor said. The priority now is to figure out what caused it," said a doctor at the No.1 Hospital of the Guangzhou Medical School in Guangzhou, the provincial capital. She wouldn't give her name.

ProMED-mail Reports





March 5: First Canadian death




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Acute Respiratory Syndrome in Hong Kong SAR, Viet Nam

- WHO Press Release 12 Mar 2003
 - WHO issues a global alert about cases of **atypical pneumonia**. Cases of severe respiratory illness may spread to hospital staff. Since mid February 2003, WHO has been actively working to confirm reports of outbreaks of a severe form of pneumonia in Viet Nam, Hong Kong Special Administrative Region (SAR), China, & Guangdong province in China.

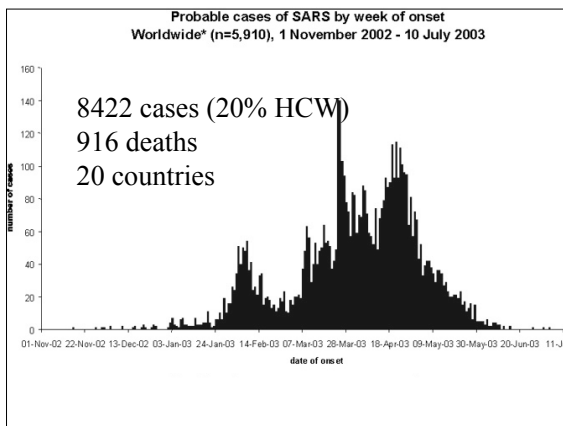


SARS - Canada

ProMED-mail was a major source of information and alerted Canadian health care workers to SARS

"The identification of SARS in Canada only a few weeks after an outbreak on another continent exemplifies the ease with which infectious agents can be transmitted in this era of international travel. It also demonstrates the importance and value of information and alert systems such as the Department of Communicable Disease Surveillance Response of the World Health Organization and the Disease Outbreak News Web site (<http://www.who.int/csr/don>) and the ProMED-mail (Program for Monitoring Emerging Diseases) reporting network sponsored by the International Society for Infectious Diseases (<http://www.promedmail.org>)."

Poutanen SM et al., Identification of Severe Acute Respiratory Syndrome in Canada, N Eng J Med (2003).

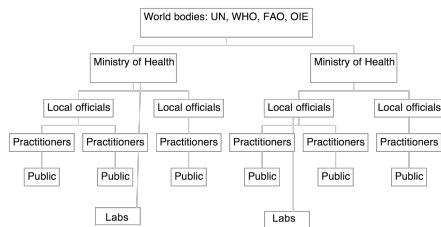


SARS virology

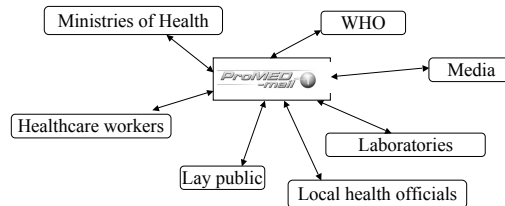
- Prior to establishment of an official laboratory network, ProMED served as an impromptu bulletin board for labs (early March 2003)
- Etiologies discussed early in the outbreak included paramyxoviruses, chlamydia, human metapneumovirus
- ProMED posted EMs, sequence and other data
- Real-time collaboration via ProMED helped promote the rapid discovery of the SARS coronavirus



Traditional public health reporting



ProMED surveillance

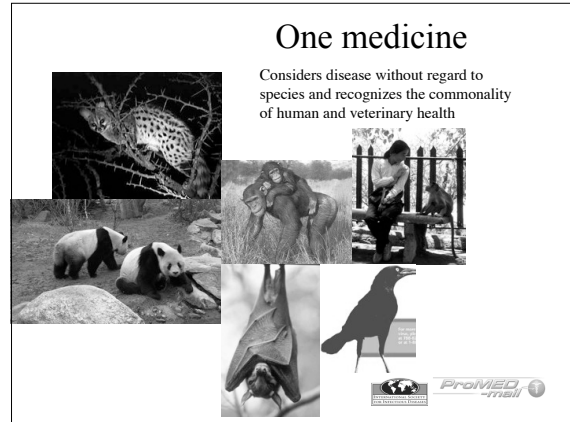


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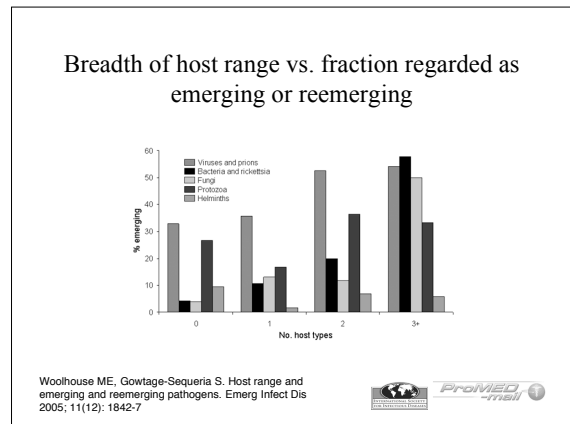
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Zoonoses in disease emergence

- 1407 human pathogens
- 58% are zoonotic
- 130 of the 177 recently emerged pathogens zoonotic (RR=2.0)


Woolhouse ME, Gowtage-Sequeria S. Host range and emerging and reemerging pathogens. *Emerg Infect Dis* 2005; 11(12): 1842-7.

ProMED and Veterinary Health


- Part of ProMED's guiding principles
- 20% of subscribers subscribe to a list specializing in animal diseases
- 4 of ProMED's 11 specialty moderators are veterinarians
- 1996-2004 over 10,000 reports on animal diseases*
 - 30% zoonotic disease -- remainder exclusively animal

*Cowen P, et al. Evaluation of ProMED-mail as an electronic early warning system for emerging animal diseases: 1996 to 2004. *J Am Vet Med Assoc* 2006; 229(7): 1090-9.



ProMED-mail reports by disease category (16 most frequent report categories) 1994-2003

| Disease | Number of reports |
|----------------------------------|-------------------|
| Dengue | 749 |
| West Nile Virus | 728 |
| Foot and Mouth Disease | 597 |
| Cholera | 578 |
| Bovine Spongiform Encephalopathy | 578 |
| Rabies | 557 |
| Anthrax | 474 |
| Ebola | 424 |
| E. coli O157 | 422 |
| Hantavirus | 340 |
| Creutzfeldt-Jakob Disease | 332 |
| Influenza | 329 |
| Salmonella | 308 |
| Malaria | 279 |
| Yellow Fever | 265 |
| Unknown illness | 209 |



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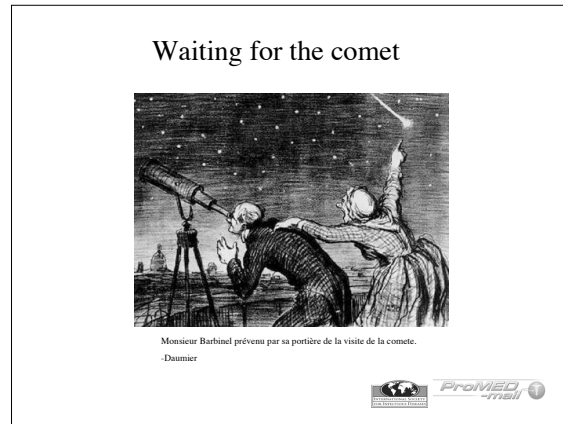
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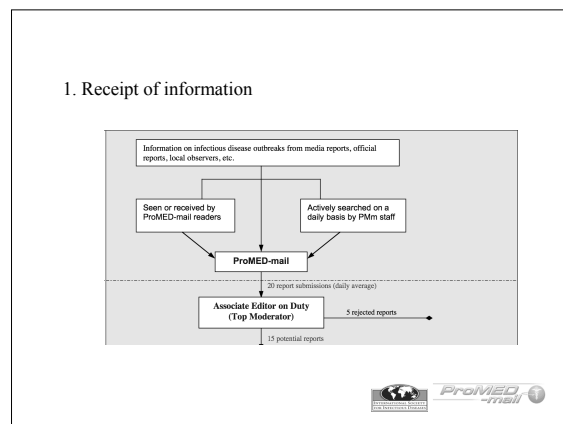
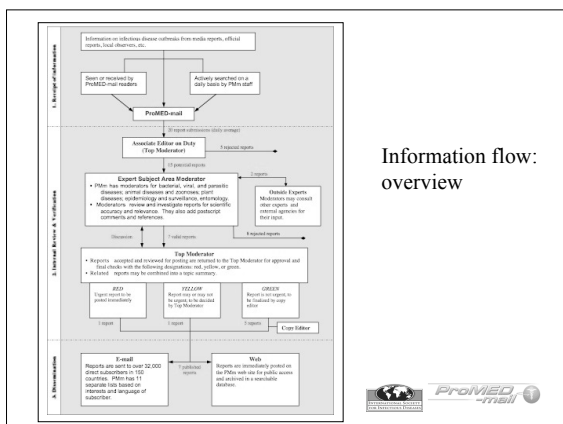
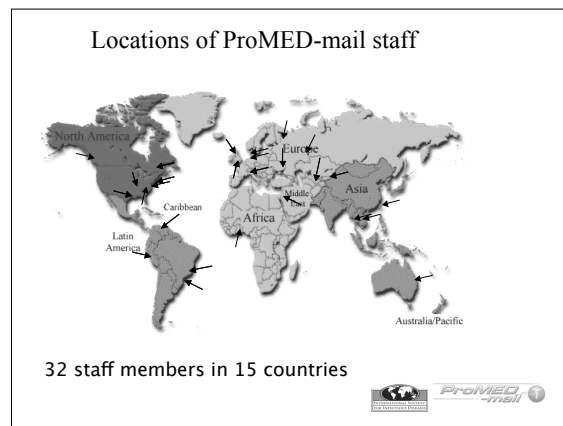
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ProMED-mail reports by disease category
January-October 2007

| Disease | Number of reports |
|-----------------------|-------------------|
| Avian influenza | 368 |
| Foot & Mouth Disease | 141 |
| Salmonellosis | 101 |
| E. coli O157 | 86 |
| Anthrax | 70 |
| Dysentery and cholera | 63 |
| Ebola & Marburg | 33 |
| XDR TB | 23 |

How ProMED-mail Operates

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Sources of information

- Official reports from Regional, National and International Public Health Authorities including labs
- ProMED-mail participant/subscribers
- Lay press reports

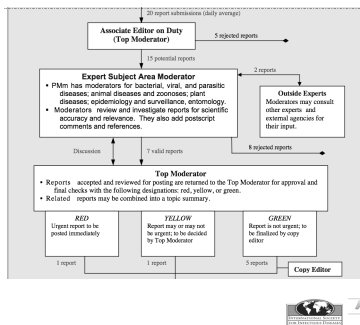


Other 'unofficial' or 'informal' sources

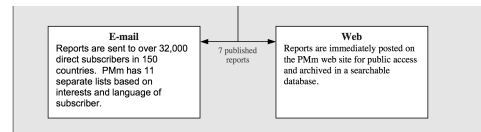
- Blogs
- Chat rooms
- Websites
- Videos (You tube, etc.)



2. Internal Review and Verification



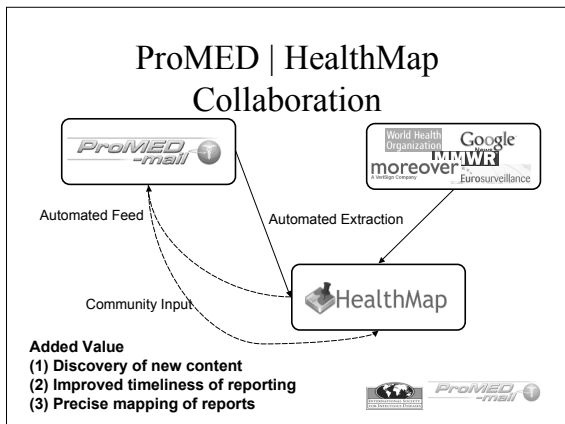
3. Dissemination of Information



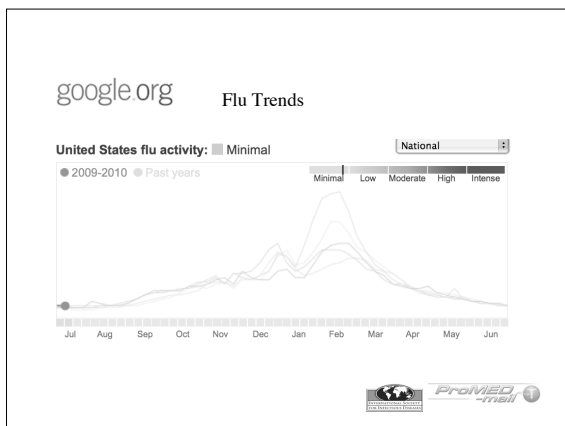
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- ### Other resources: Redundancy is good!
- GPHIN
 - Medisys (EU)
 - Emerging Infections Network (IDSA)
 - EpiX (CDC)
 - Geosentinel (ISTM)
 - GOARN (WHO)
 - Google Flu Trends



- ### Summary
- Informal sources of information complement the structured disease reporting system
 - ProMED-mail serves as an early-warning system for emerging diseases using informal sources
 - Combines rapid reporting from a wide range of sources with expert commentary
 - Provides a forum for cooperation among diverse groups
 - Multiple disease reporting systems are complementary and enhance detection
 - Free subscription at www.promedmail.org

- ### Acknowledgments
- ProMED participant/subscribers and staff
 - Google.org
 - HealthMap.org
 - Oracle Corporation
 - Harvard School of Public Health
 - Nuclear Threat Initiative
 - Rockefeller Foundation
 - Bill and Melinda Gates Foundation
 - Robert Wood Johnson Foundation

THE COMING PLAGUE
NEWLY EMERGING DISEASES IN A WORLD OUT OF BALANCE
Laurie Garrett

“We always want to believe that history happened only to ‘them,’ in the past, and that somehow we are outside history.”
--Jonathan Mann

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| THE NEXT FEW TELECLASSES | |
|--------------------------|---|
| 21 Jul. 09 | (Free British Teleclass) Fitness for Purpose in Infection Control Speaker: Martin Kiernan, Southport and Ormskirk NHS Trust |
| 06 Aug. 09 | (Free Teleclass) How Professional Associations Can Best Contribute to Infection Prevention Globally Speaker: Dr. Cathryn Murphy, Bond University, Australia |
| 13 Aug. 09 | (Free Teleclass) Safe Childbirth: What Can Infection Prevention Contribute? Speaker: Patricia Lynch, Chair, IFIC Safe Childbirth Special Interest Group |
| 27 Aug. 09 | (Free South Pacific Teleclass) Live Broadcast from the NZICND Conference, New Zealand Approaches to eLearning for Infection Prevention and Control Speaker: Dr. John Ferguson, Hunter New England Health, Australia |
| 10 Sep. 09 | Influenza Vaccination of Healthcare Workers Speaker: Monica Mehta & Dr. Charles Pastor, Long Island University |

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