

# NEWS in Science and Technology



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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 18,3) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at [www.ctcase.org](http://www.ctcase.org).

## FEATURE ARTICLE: HEALTH

### ➤ The AIDS Pandemic: How Did It Happen, and Is SARS Next?

*Michael Merson, Dean of Public Health, Yale University and Academy Member, delivers Keynote Address at the Annual Meeting of the Academy.*

- AIDS: most devastating pandemic in recorded history. By the end of 2002, 22 million deaths, 70 million infected, 42 million living with HIV-AIDS, and 15,000 new infections daily.
- In sub-Saharan Africa: 1/3 of young adults infected; 12 million children orphaned; 30% of teachers in some African countries infected; 20% of skilled laborers in South Africa will have HIV by 2015.
- *How did it happen?* Merson's short answer: "world leaders — all of us — let it happen."
  - "Global response to AIDS has been mostly delayed, fragmented, inconsistent, and grossly inefficient."
  - Nature of disease made it difficult for political and community leaders, and even parents, to talk about it.
  - AIDS was associated with stigmatized and marginalized groups — which engendered moralistic and discriminatory responses that have consistently failed.
- Merson believes that there is *cause for hope*.
  - Some countries, notably Uganda, Thailand, Senegal, and Brazil, have "turned national epidemics around" through effective political leadership, local community response; appropriate prevention strategies, and application of national resources and commitment.
  - The United Nations established UNAIDS to provide a common strategic framework and fundraising strategy across the UN system; General Assembly adopted a Declaration of Commitment that set specific goals for national and international responses to AIDS.
  - Differential drug pricing and generics availability for resource poor countries greatly reduced therapy costs.
- *Can we slow the pandemic?* Yes.
  - Apply sound prevention activities.
  - Continue efforts to seek an AIDS vaccine.
- Is SARS (Severe Acute Respiratory Syndrome) next?
  - Similarities: both caused by infectious agent that most

likely existed in animal species and mutated to cause infection in humans; both provoked irrational fears.

- Differences: 8,000 reported cases of SARS, compared with 15,000 new cases daily of HIV infection.
- SARS highlights two aspects of globalization: Air travel promoted spread of illness when Chinese government did not report SARS cases for four months, but on the other hand, international research quickly identified the cause of SARS, isolated the coronavirus, sequenced its genes and communicated results via the internet.
- Too early to tell if SARS will become global pandemic: SARS is hard to spread; control approaches are working; SARS may emerge again when weather turns cold; global cooperation provides opportunity to control regional outbreak of SARS or other pathogen.

[See [www.ctcase.org/cr.html](http://www.ctcase.org/cr.html)]

## ENVIRONMENT

### ➤ Atmospheric Models for First Responders

*A National Research Council report reviews applicability of atmospheric computer models that help predict how hazardous agents disperse in the air for use by emergency personnel in the event of a chemical, biological, or radiological attack. The report finds that:*

- Atmospheric computer models track how a plume of hazardous material might fan out, or a virus might spread through a population.
- Models are not well designed for complex topographical features, or urban environments, and do not adequately describe variables that are part of any dispersion forecast.
- Report is result of workshop in summer 2002 attended by atmospheric scientists and emergency management officials.
  - Discussion focused on ways to improve the models, and communication between first responders and scientists who run the models.
  - Report finds emergency responders face confusing array of models — and do not have clear understanding of where to go for immediate assistance.
  - Report suggests a single federal point of contact be established to immediately connect rescue personnel across the country with appropriate modeling centers.

[See [www.nap.edu/books/0309089263/html](http://www.nap.edu/books/0309089263/html)]

## HEALTH

### ➤ Electronic Health Records

*A committee of the Institute of Medicine issued a report identifying core functions that electronic health records (EHRs) should be capable of performing to promote greater safety, quality, and efficiency in health care delivery.*

- List of key capabilities will be used by Health Level Seven (HL7), one of the world's leading developers of health care standards, to devise a common industry standard for EHRs that will guide efforts of software developers.
- Eight core functions selected on basis of improving patient safety, supporting effective care, assisting in management of chronic disease, and improving efficiency.
- All EHRs must protect patient privacy and confidentiality, and comply with standards for security.
- The report predicts EHRs will be available and implemented in many health systems and regions by 2010.

[See <http://www.nap.edu/books/NI000427/html/>]

### ➤ A New Vaccine Strategy

*The Institute of Medicine has released a new report that indicates that the United States needs a new approach to financing and distributing vaccines in order to achieve more widespread immunization and to sustain the development and production of vaccines.*

- Report reveals high levels of immunization in United States, but significant disparities remain in access to vaccines across geographic and demographic areas.
  - Disparities, in part, result from fragmented public-private health care systems – 10% of children lack insurance coverage for immunization.
  - Access further limited by vaccine shortages in 2001 and 2002.
- Government's purchasing policy, which seeks to curb expenditures and decrease costs and leaves little financial incentive for companies to develop new vaccines, contributes to problem.
- The report's recommendations would result in effectively transforming the government's role from buying vaccines to assuring immunization. The report recommends that a new

insurance mandate, combined with a government subsidy and voucher plan to administer all recommended vaccines, should be implemented.

[See <http://www.nap.edu/books/0309089794/html/>]

### ➤ New Smallpox Vaccine Recommendations

*A recently released report from the Institute of Medicine recommends members of the general public not receive smallpox vaccine except as part of a research study or other equally stringent clinical arrangement due to potential risks associated with smallpox vaccine for recipients as well as people with whom they have close contact. The report:*

- Urges creation of registries of health care workers and others who have been vaccinated and trained in smallpox response, to provide rapid mobilization and coordination in the event of an outbreak.
- Recommends multi-step approach for inoculations of public.
- Suggests a baseline standard of preparedness be established at the national level with Centers for Disease Control and Prevention facilitating development of various hypothetical scenarios that states could use to test and improve response plans and capabilities.

[See <http://www.nap.edu/books/NI000429/html/>]

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