

# Why Communication Science Is Vital to Progress against Disease in the 21st Century

Bradford W. Hesse, PhD  
May 10, 2006

U.S. DEPARTMENT  
OF HEALTH AND  
HUMAN SERVICES  
National Institutes  
of Health



Health Communication &  
Informatics Research Branch,  
BRP, DCCPS



NCI Office of Communication  
Office of the Director

# NIH Strategic Vision for the 21<sup>st</sup> Century

# NIH Roadmap

“In 20 years we’re going to have what I call the ‘three Ps medicine: predictive, personalized, and preemptive. That’s my vision.”

Elias Zerhouni, MD  
Director, NIH\*



\* From Culliton, B. Extracting Knowledge from Science: A Conversation with Elias Zerhouni. Health Affairs 25 (2006): w94–w103 .

# Transforming Medicine in 21<sup>st</sup> Century\*

20th Century	21st Century
Treat disease when symptoms appear and normal function is lost	Intervene before symptoms appear and preserve normal function for as long as possible
We did not understand the molecular and cellular events leading to disease	Understanding of preclinical molecular events and ability to detect patients at risk
Expensive in financial and disability costs	Orders of magnitude more effective

\*Zerhouni, E. *FY 2006 Budget: NIH and 21st Century Medicine*. Presented to House Appropriations Subcommittee on Labor/HHS/Education, (March 9, 2005).

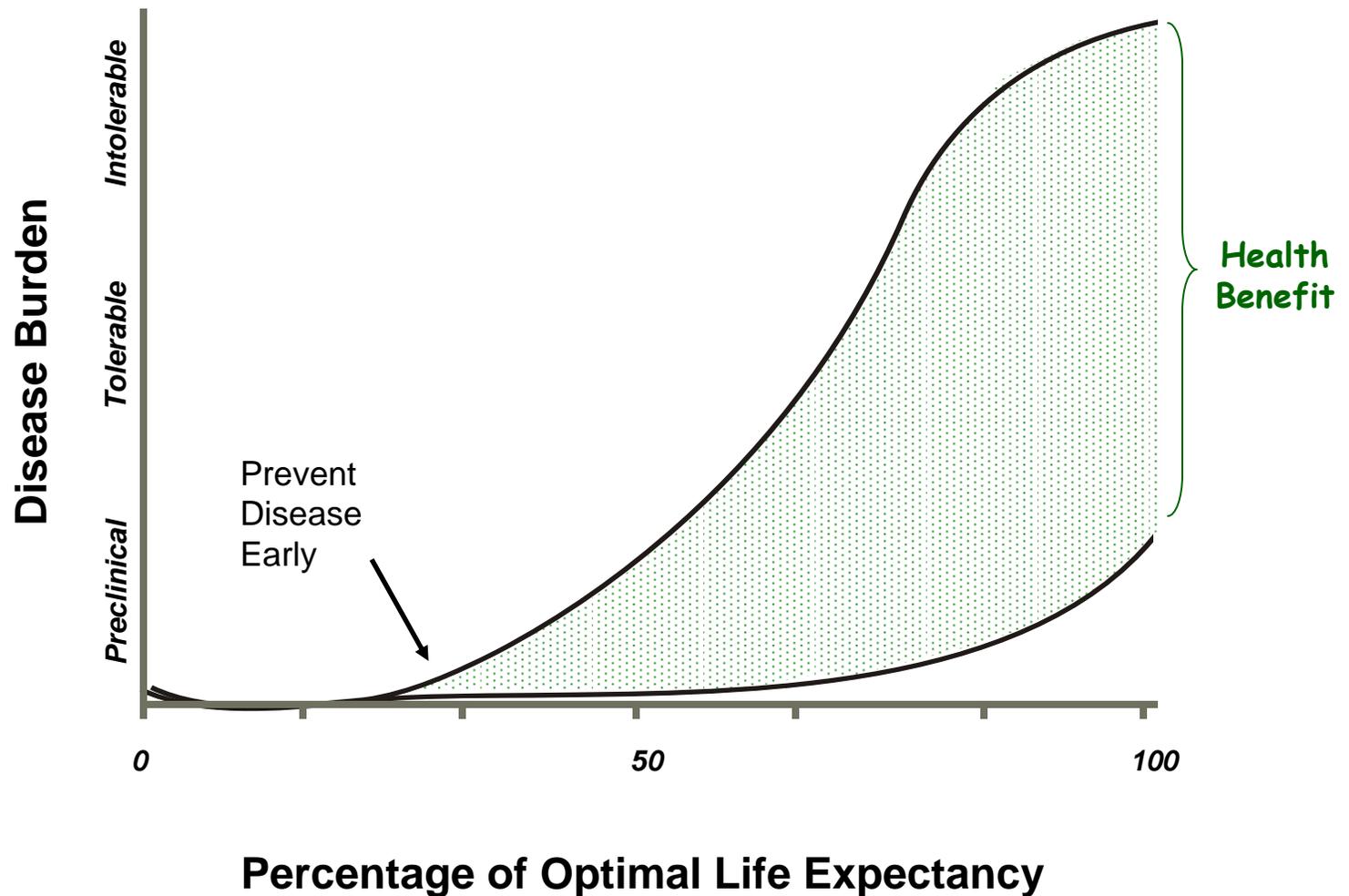
# Transforming Medicine in 21<sup>st</sup> Century

20th Century	21st Century
Treat disease when symptoms appear and normal function is lost	Intervene before symptoms appear and preserve normal function for as long as possible
We did not understand the molecular and cellular events leading to disease	Understanding of preclinical molecular events and ability to detect patients at risk
<b>We did not understand the person-based or macro-level influences moderating disease*.</b>	<b>Multiple levels of analysis from “cells” to “system” improves population health*.</b>
Expensive in financial and disability costs	Orders of magnitude more effective

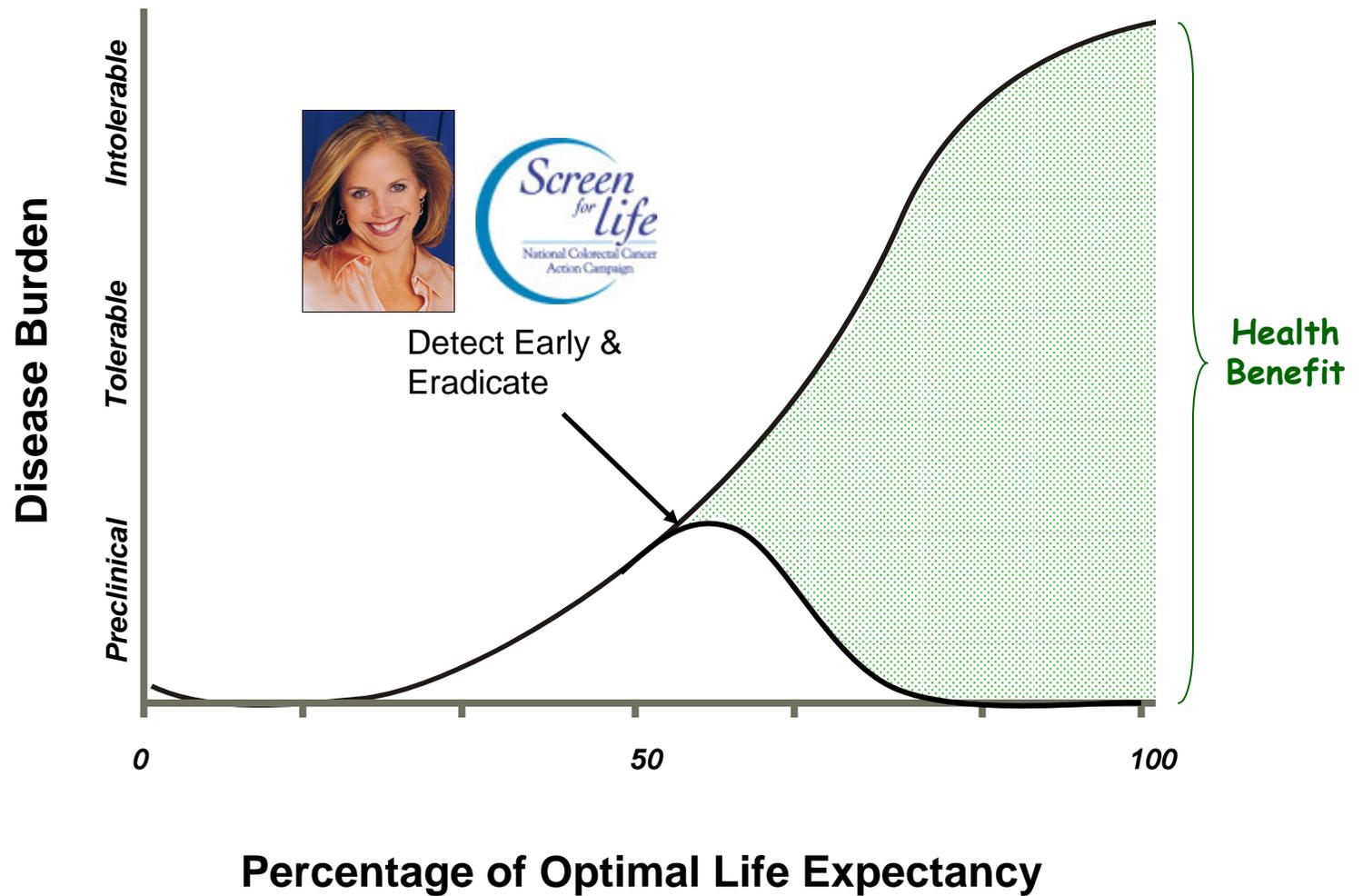
\*Row added.

## Example: Preemption in Type 2 Diabetes

**Diabetes Prevention.** NIH study found: Lose 5-7% of your body weight through diet and exercise, prevent or delay onset of Type 2 Diabetes

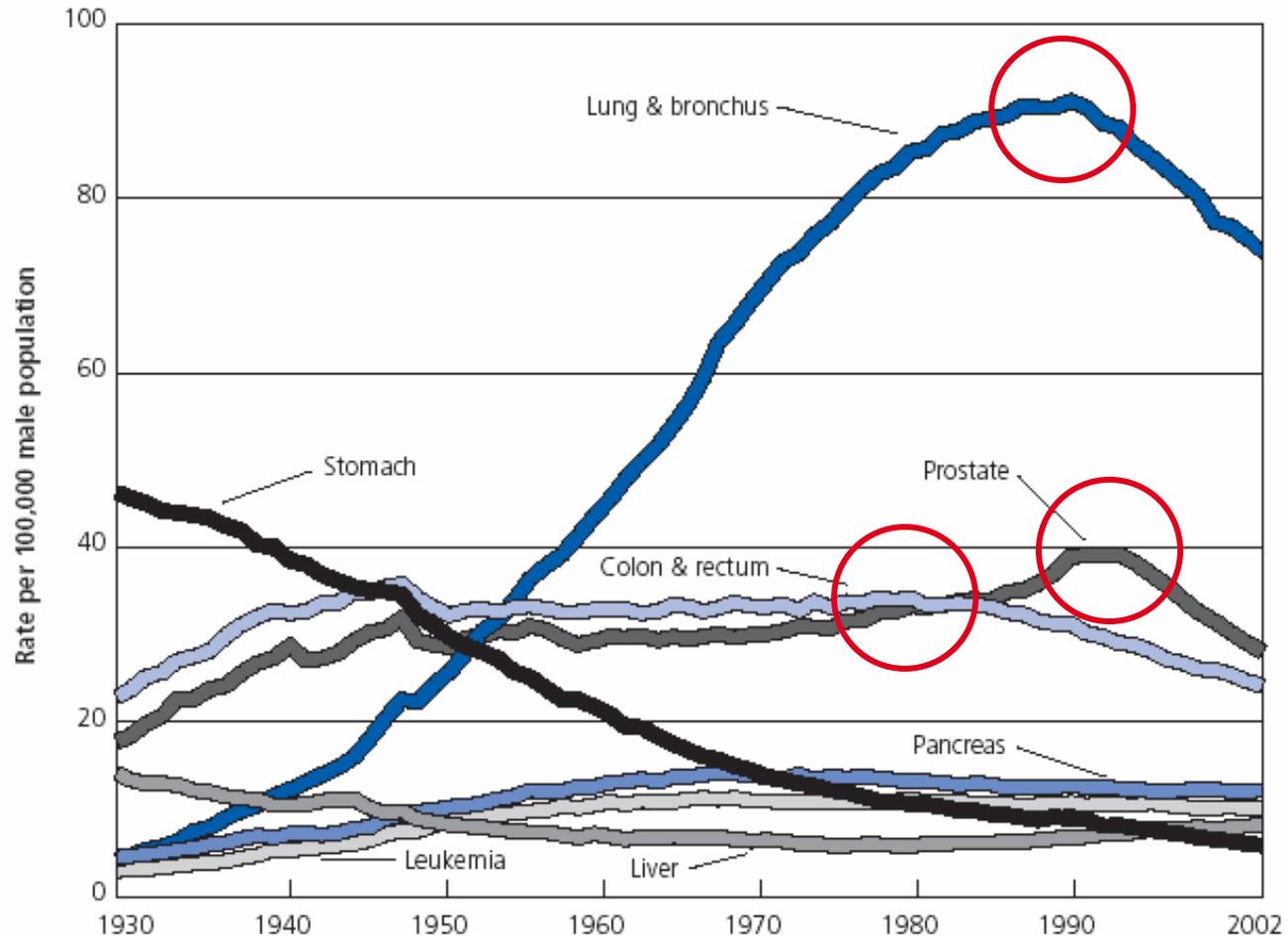


# Example: Preemption in Colorectal Cancer



# Age Adjusted Cancer Deaths Going Down

Age-Adjusted Cancer Death Rates,\* Males by Site, US, 1930-2002



\*Per 100,000, age-adjusted to the 2000 US standard population.

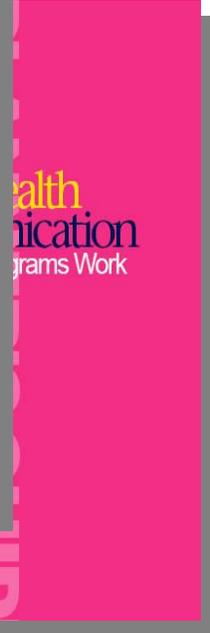
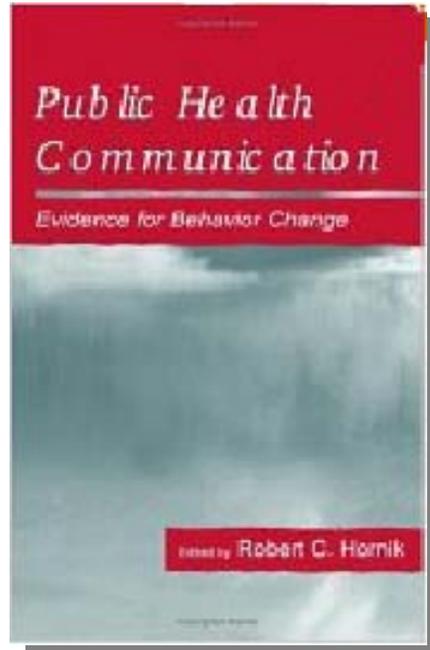
**Note:** Due to changes in ICD coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

**Source:** US Mortality Public Use Data Tapes 1960 to 2002, US Mortality Volumes 1930 to 1959, National Center for Health Statistics, Centers for Disease Control and Prevention, 2005.

American Cancer Society, Surveillance Research, 2006

# An “Extraordinary Opportunity” in Health Communication and Informatics

# Foundation & New Priorities



Initial Evidence Base for Behavior Change



National Priorities To Advance Science; Expand Reach, Effectiveness, and Efficiency

# Cancer Communication Selected as “Extraordinary Opportunity” within NCI Budget

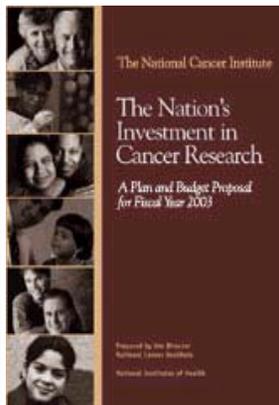
## 6

## Cancer Communications

### THE OPPORTUNITY

It is not unusual today for newly diagnosed cancer patients to go to their doctors' appointments armed with printouts from CancerNet or other Web sites and lots of questions. People have more ways than ever to get information: by telephone, fax, email, the World Wide Web, TV and radio, and in person. And the future holds even more choices: automated monitoring of vital signs, voice recognition software, wider use of wireless technology, and other technologic advances to make it easier and faster for people anywhere to access the best information about cancer.

NCI's opportunity is to optimize the use of these tools while enhancing the absolutely essential interaction of patients with their doctors and nurses.



## Making the Science *Predictive*



- How can science match needs of a rapidly changing communication environment?

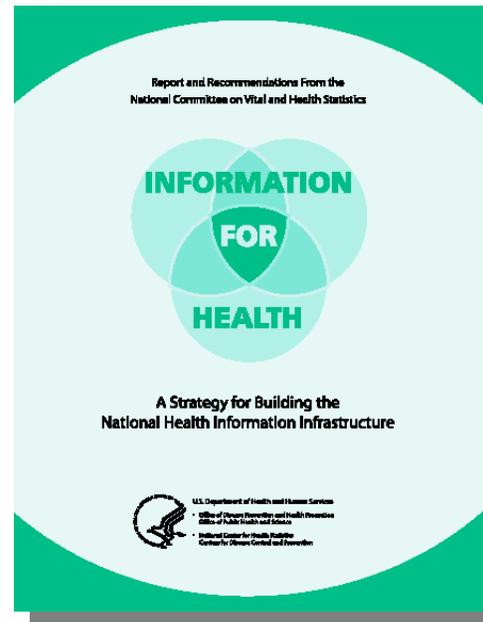


E.g., "Seeking / Scanning" behaviors [Hornik]; Consumer informatics [Hesse]

## Making the Science *Predictive*

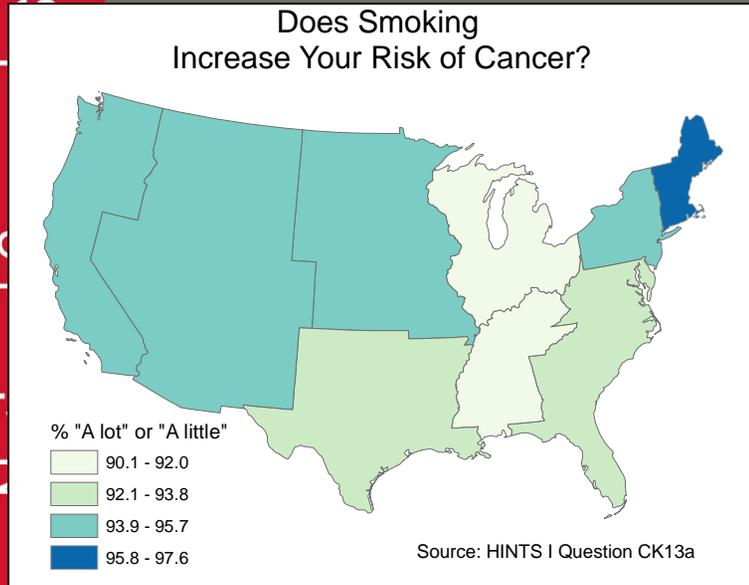


- How can science match needs of a rapidly changing communication environment?
- What needs do we anticipate from changes in medical & consumer informatics?

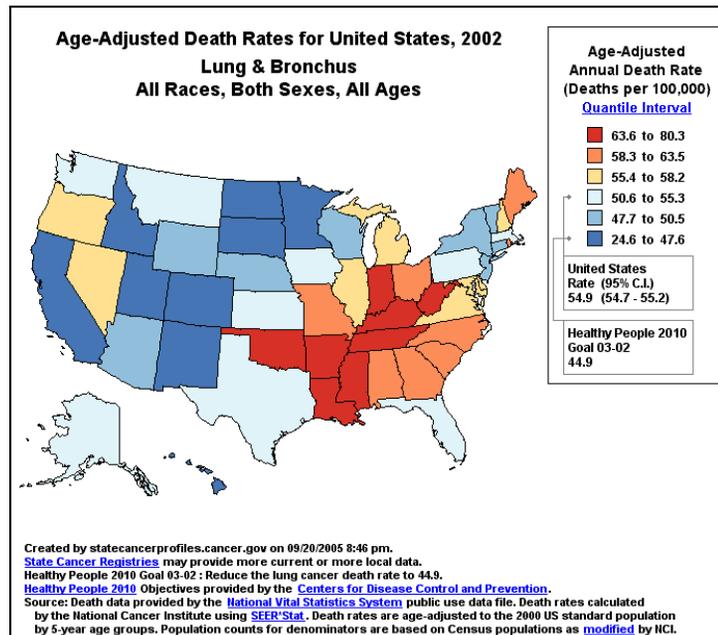


National Health Information Infrastructure (Network) to support federated data sources, electronic health infrastructures (DHHS)

# Making the Science *Predictive*



- How can science match needs of a rapidly changing communication environment?
- What needs do we anticipate from changes in medical & consumer informatics?
- How can we "diagnose" and "treat" population disparities?



← Knowledge mapping at population level [Stinchcomb, Pickle, Hesse, Viswanath]

## Making the Science *Personalized*



Personalized health information kiosk [Kreuter]

- How do we meet consumers' needs through interactive technology?



Online interactive health promotion applets [Strecher]

## Making the Science *Personalized*



Role of narratives to enhance  
social cognition (modeling)  
effects [Kreuter]

- How do we meet consumers' needs through interactive technology?
- How do we target at-risk populations?

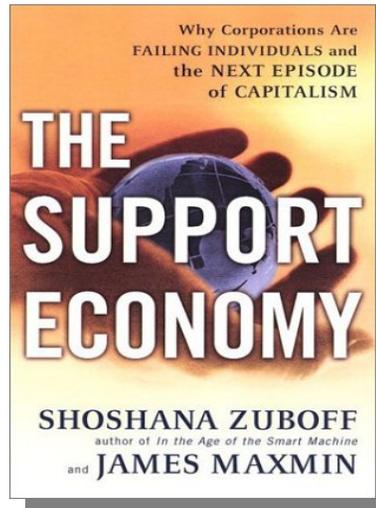
## Making the Science *Personalized*

### **The New York Times**

Awash in Information, Patients  
Face a Lonely, Uncertain Road



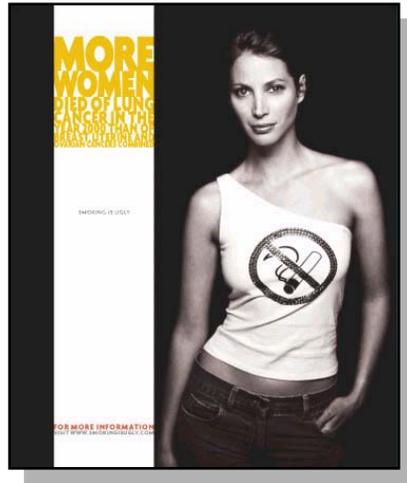
Nicole Bengiveno/ New York Times



Comprehensive Support  
Systems [Gustafson; Arora]

- How do we meet consumers' needs through interactive technology?
- How do we target at-risk populations
- How do we make our information systems "patient-centric" and "support-oriented?"

## Making the Science *Preemptive*



- How do we maximize the effectiveness of our messages?



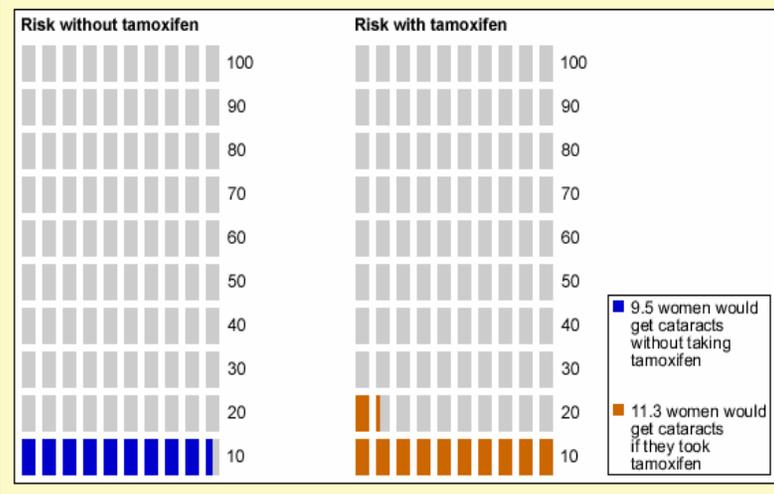
Functional MRI to assess sensation value / orientation response for messages  
[Capella, Lerman, Hornik]

## Making the Science *Preemptive*



- How do we maximize the effectiveness of our messages?
- How do we prevent misunderstanding from medical evidence?

The graph on the left shows the number of women out of 100 who would get cataracts without taking tamoxifen. The graph on the right shows the number of women out of 100 who would get cataracts if they took tamoxifen.



← Graphical presentations of comparative risk information [Ubell, Strecher]

# Making the Science *Preemptive*

ABC NEWS ORIGINAL REPORT

## Digital Medical Records Survive Katrina



**Sept. 16, 2005** — In this week's "Cybershake," we take a look at how Hurricane Katrina didn't beat war veterans — or, at least not their medical records.

The Department of Veterans Affairs ditched conventional paper-based

- How do we maximize the effectiveness of our messages?
- How do we prevent misunderstanding from medical evidence?
- How do we prevent displacement, broken chain of care?

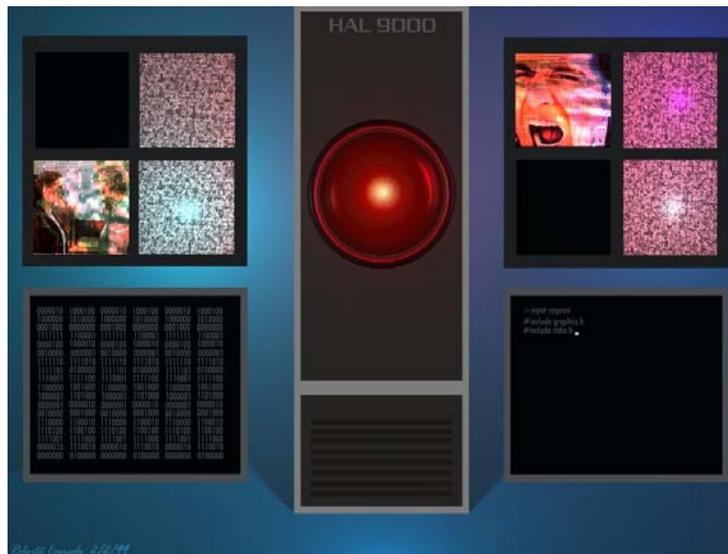


← Role of electronic health records to ensure continuity of care [DHHS, AMIA]

# Research in Health Communication & Informatics

# Health Communication and Informatics: A Transdisciplinary Problem

Early computer engineering asked  
“what can the computer do?”



Question in health care is  
“what can people do?”

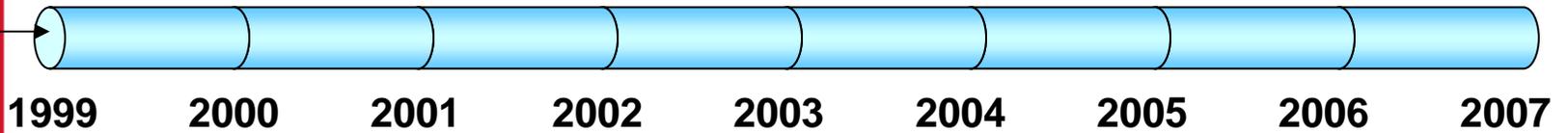
... a Health Communication Problem.

---

“Everyone thought IT was about computers, but we’ve refined that to say that IT is about health care — it’s about the experience we really have.”

-David Brailer, 2005

# Timeline: Health Communication & Informatics Research Investments

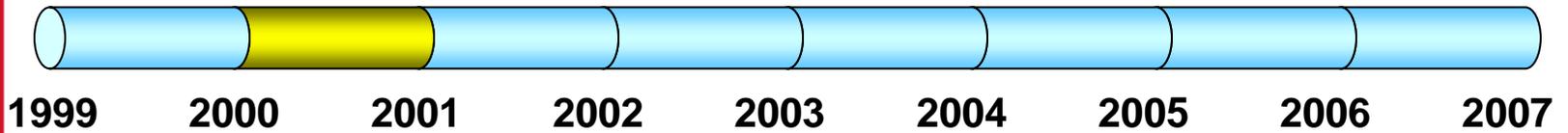


Health Communication and Informatics Research Branch Created

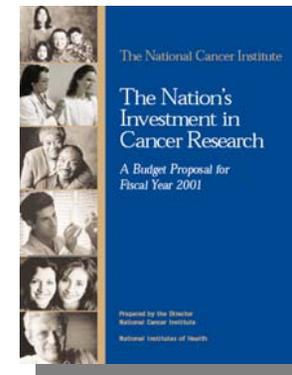
- Part of Behavioral Research Program
- Intramural / Extramural Hybrid
- Interdisciplinary emphasis



# Timeline: Health Communication & Informatics Research Investments

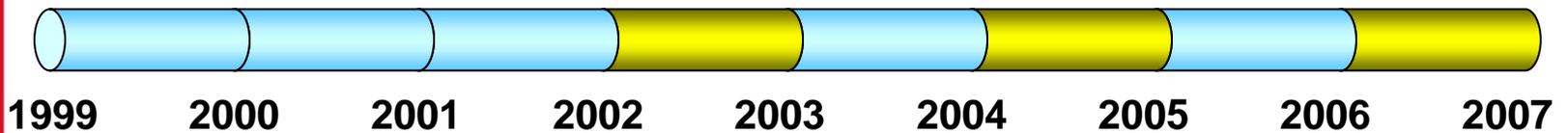


- Nomination Process for Priorities
- Cancer Communication Selected as "Extraordinary Opportunity"



# Timeline: Health Communication & Informatics Research Investments

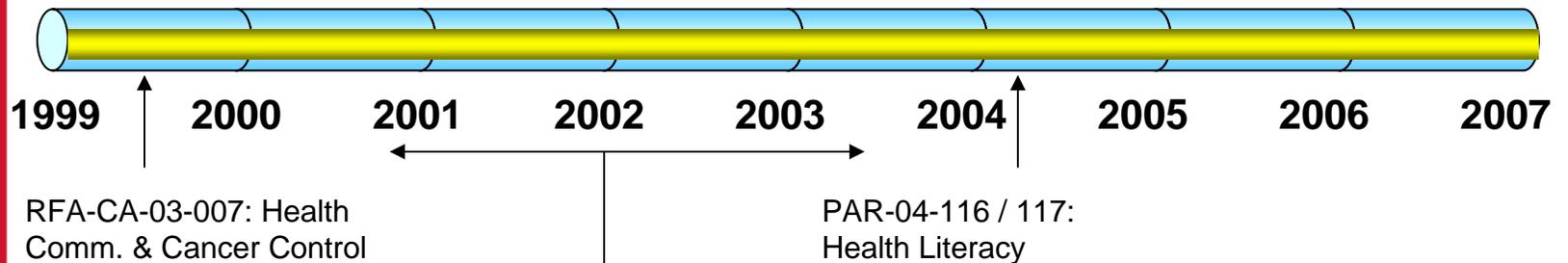
Surveillance & Research Program Launched



- National probability survey
- Biennial administration
- Monitor trends in communication, knowledge
- Linked to other Federal Surveys
- Public access data

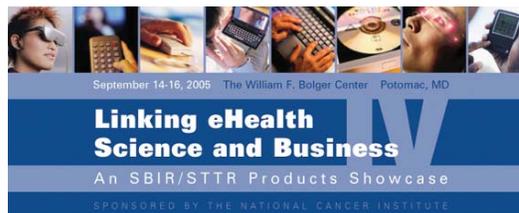
# Timeline: Health Communication & Informatics Research Investments

- Extramural grant program: R03, R21, R01
- SBIR / STTR Multimedia Grants
- Specialized SBIR Contracts



RFA-CA-03-007: Health Comm. & Cancer Control

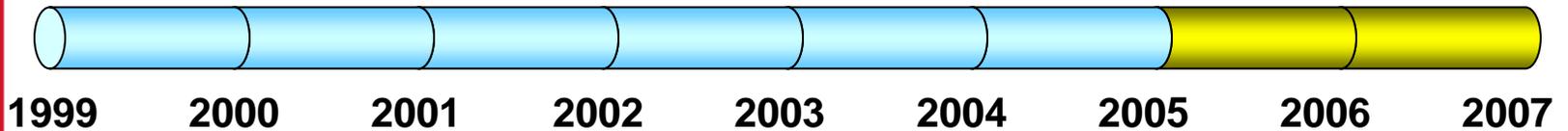
PAR-04-116 / 117: Health Literacy



SBIR / STTR: Multimedia & Cancer Comm.

# Timeline: Health Communication & Informatics Research Investments

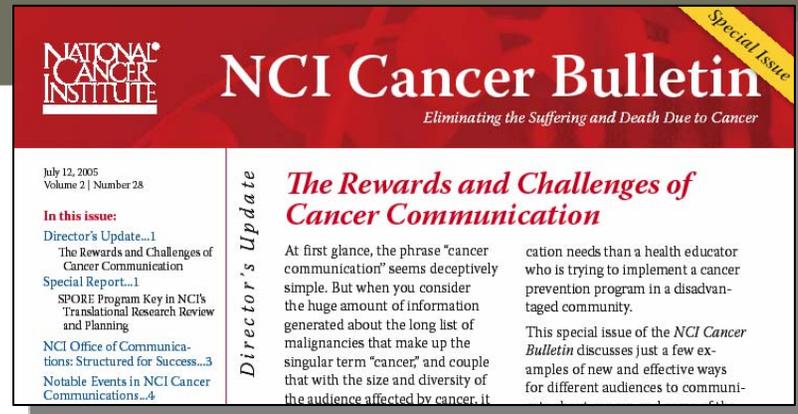
- Fully equipped media & technology lab (with portable equipment)
- User-centered design & cognitive testing capabilities
- Conducts needs assessments, formative evaluation, prototyping
- Emphasizes interface between informatics and users



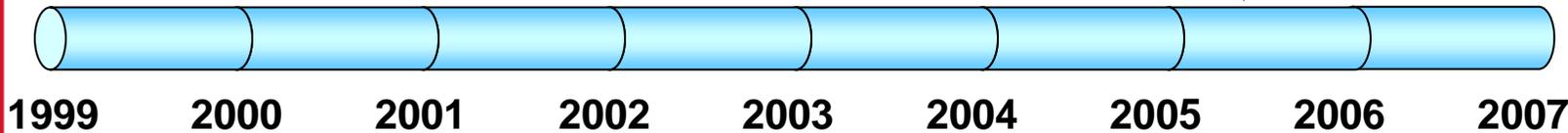
User Centered Informatics Research

# Timeline: Health Communication & Informatics Research Investments

- Cancer.gov Redesign
- Cancer Bulletin Launched
- HINTS Briefs
- Translational Supplements
- Cancer Control Planet



July 12, 2005



Spring, 2004



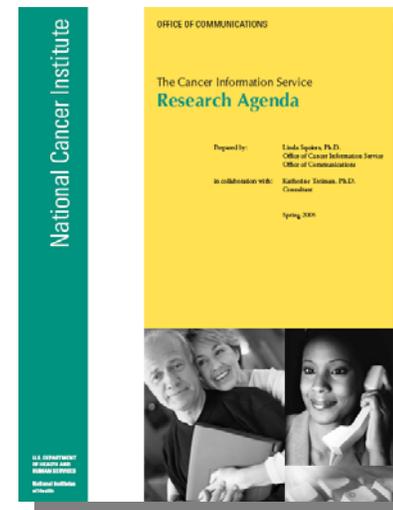
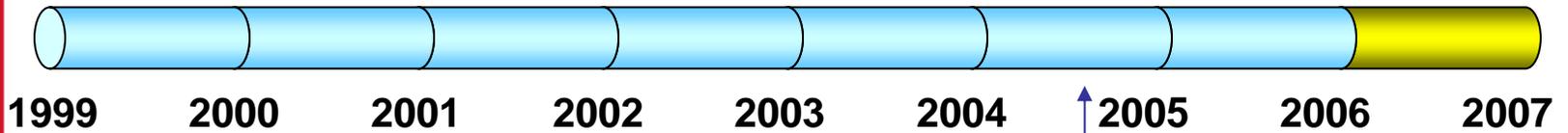
# Timeline: Health Communication & Informatics Research Investments

## Cancer Information Service Research Activities

- Research Coordinators Named
- Research Agenda Released
- R-21 Request for Applications



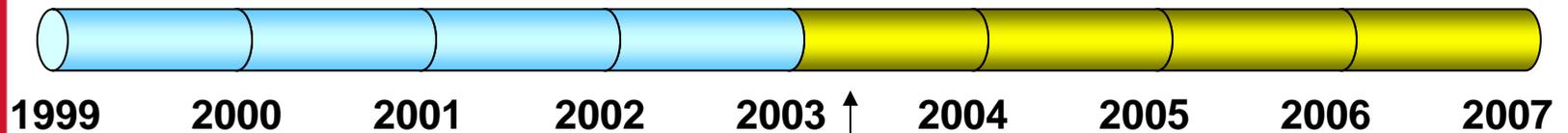
RFA-CA-06-015:  
Exploratory Grants for CIS



# Timeline: Centers of Excellence in Cancer Communication Research – Keystone Investment

## P-50 Centers Mechanism emphasizing:

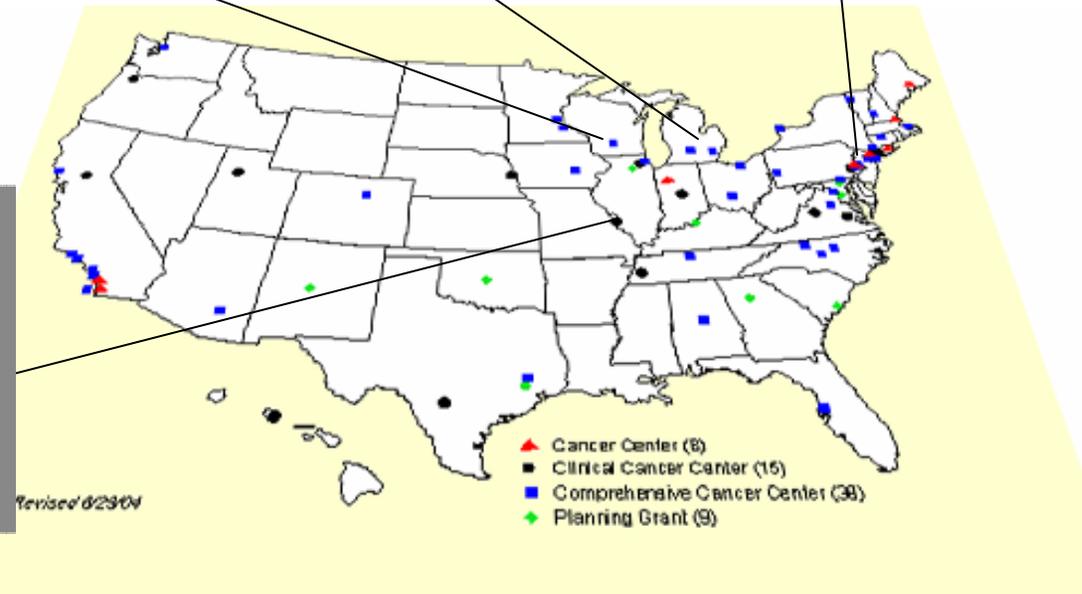
- Interdisciplinary science
- Advanced knowledge base in health communication & informatics
- Novel solutions, innovative methods
- Evidence base for communication practitioners
- Training ground for new generation of communication scientists



Centers of Excellence in  
Cancer Communication  
Awarded



# Centers of Excellence in Cancer Communication Research



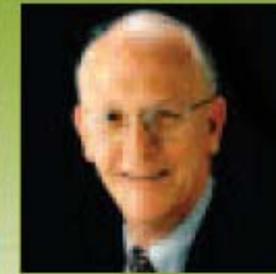
# Centers of Excellence in Cancer Communication Research



**Robert C. Hornik, Ph.D.**  
Principal Investigator,  
University of Pennsylvania  
Annenberg School for  
Communication



**Victor J. Strecher, Ph.D.**  
Principal Investigator,  
University of Michigan  
Comprehensive Cancer  
Center



**David H. Gustafson, Ph.D.**  
Principal Investigator,  
University of Wisconsin  
Center for Health Syst  
Research & Analysis



**Matthew W. Kreuter, Ph.D.**  
Principal Investigator, Saint  
Louis University Health  
Communication Research  
Laboratory