The Communications Revolution and Health Inequalities in the 21st Century

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The Communications Revolution

The New York Times

New U.S. Research Will Aim at Flood of Digital Data

Big data refers to the rising flood of digital data from many sources, including the Web, biological and industrial sensors, video, e-mail and social network communications.

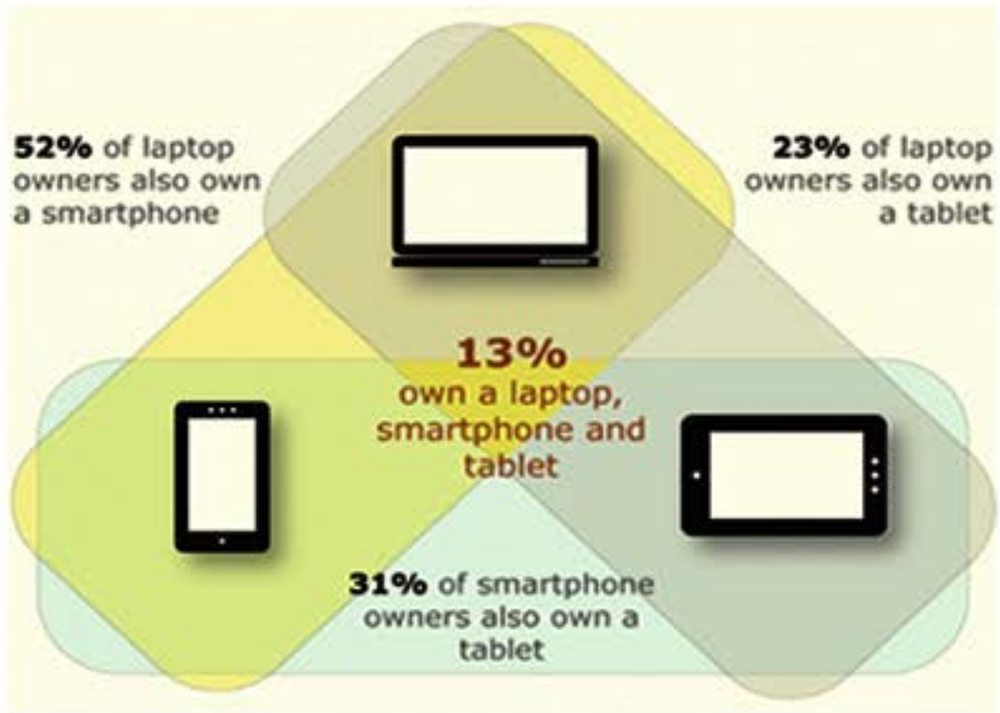
For example, if you buy a used car, your best bet is an orange one. Data scientists at Kaggle, a pattern recognition start-up …., have matched previously separate data sets on buyers, colors and after-purchase problems. They figured out that if a car' s original owner chose an odd color, the car was most likely a means of self-expression. That self-identification raises the odds that the owner cared more than usual for the vehicle.

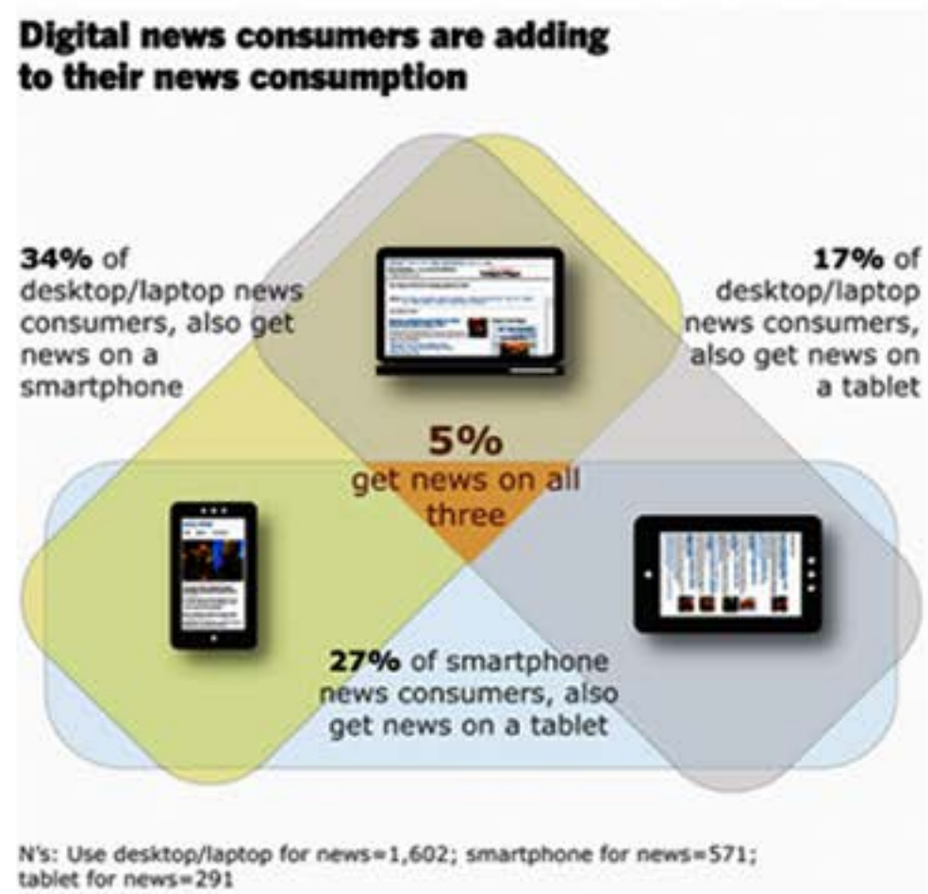
Forbes

What Does It Take to Turn Big Data into Big Dollars?

volume of data now being produced continues to skyrocket, with something on the order of **2.7 Zettabytes (2.7 x 1021)** of information to be produced in 2012

Communication devices and their use





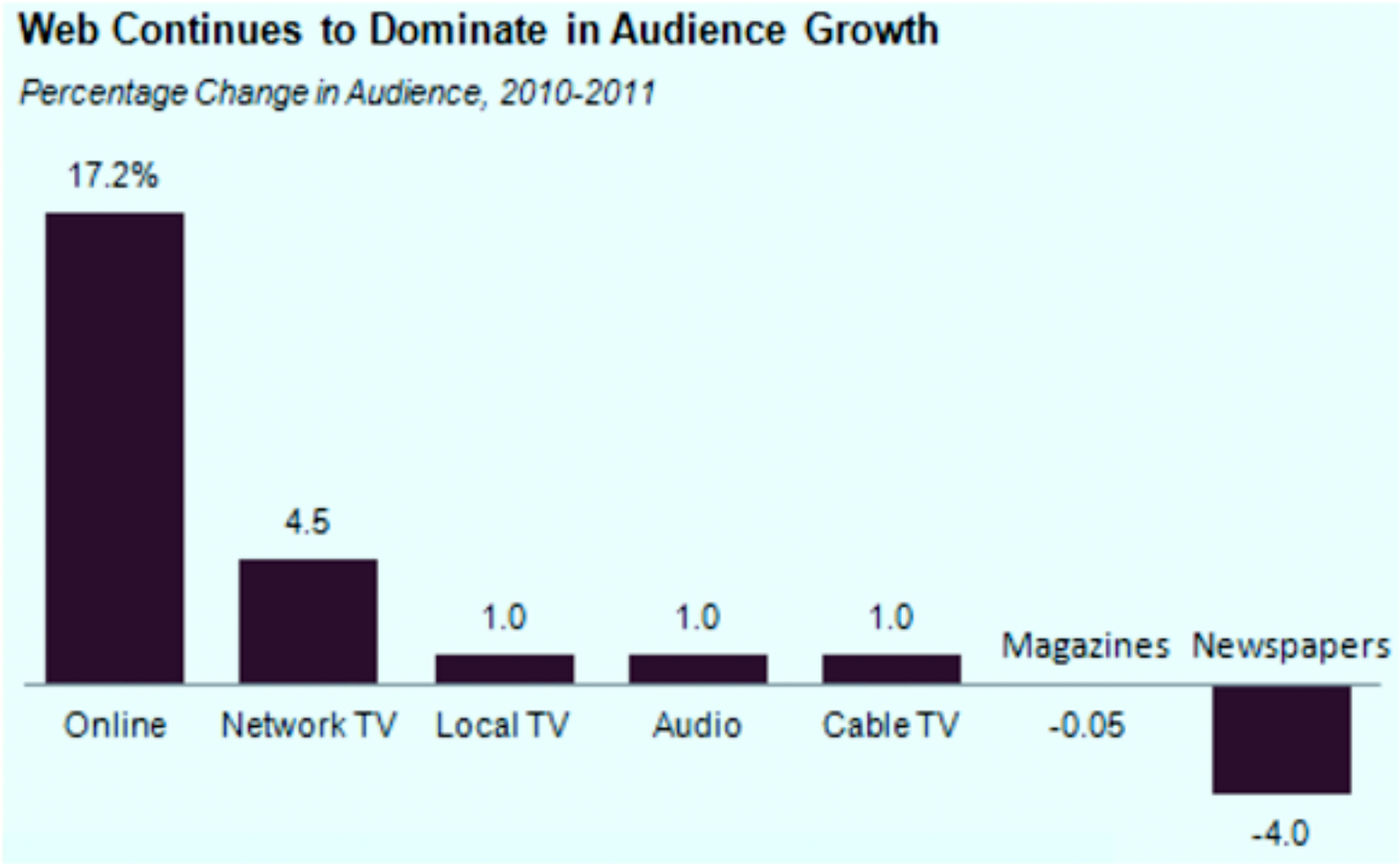
The Pew Research Center´s Project for Excellence in Journalism (2012). The State of the News Media 2012. Accessed on March 31 at: http://stateofthemedia.org/2012/overview-4/key-findings/

Web 2.0- A Key Component to the Growing Media World

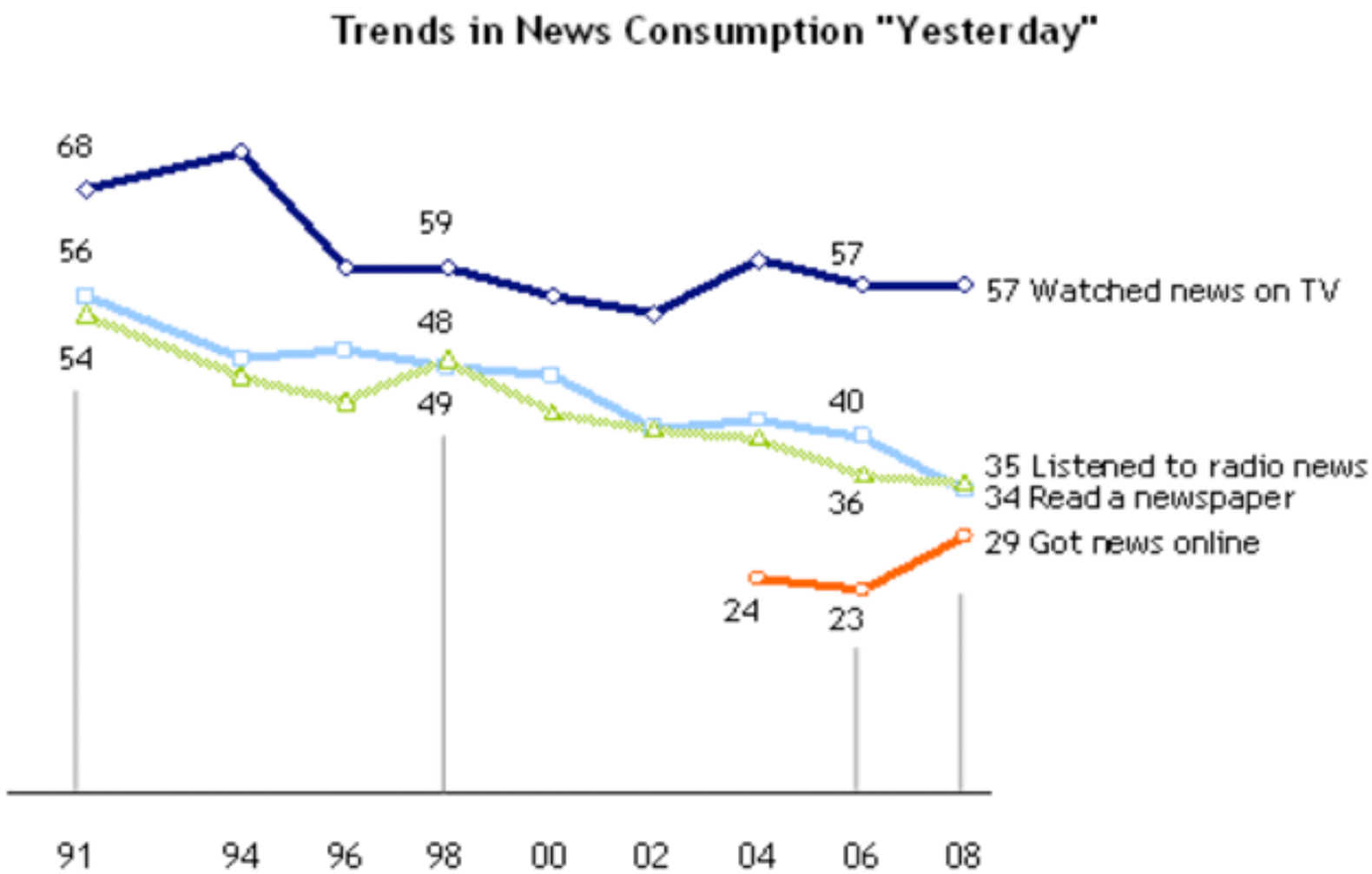
Growing from small number of one-way information sources to a complex multi-way exchange

- Potential for low-cost, high reach information exchange
- Facilitates new opportunities for physician communication
- Strengthens social support through online networks
- Creates a more engaging patient environment

New platforms


Web Continues to Dominate in Audience Growth
Percentage Change in Audience, 2010-2011
17.2%
4.5
1.0
1.0
1.0
Magazines
Newspapers
Online
Network TV
Local TV
Audio
Cable TV
-0.05
-4.0

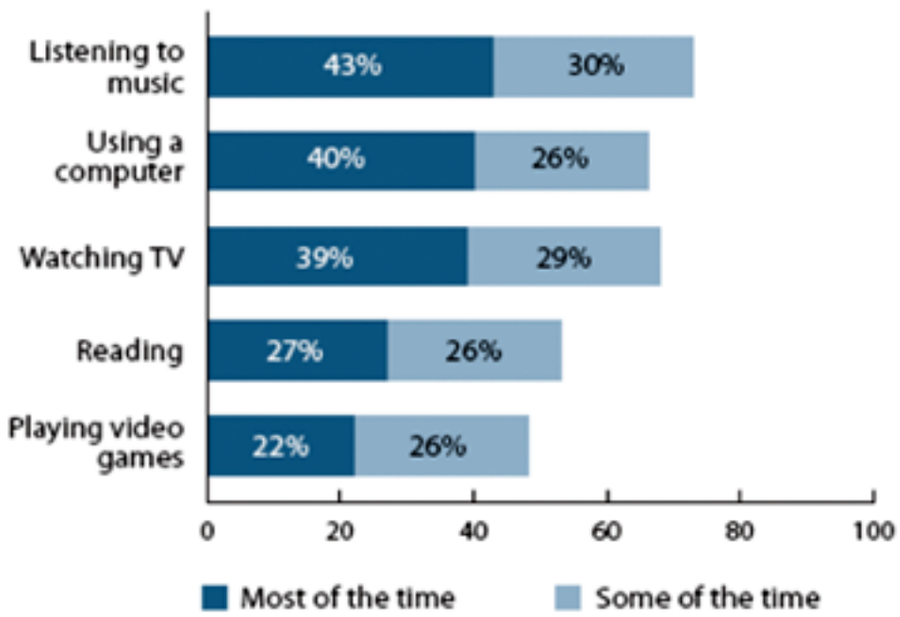
Trends in news consumption



Media use

Media Multitasking, by Medium

Proportion of 7th–12th graders who say they use another medium "most" or "some" of the time while:



Media Use Over Time

Among all 8- to 18-year-olds, average amount of time spent with each medium in a typical day:

	2009	2004	1999
TV content	4:29[a]	3:51[b]	3:47[b]
Music/audio	2:31[a]	1:44[b]	1:48[b]
Computer	1:29[a]	1:02[b]	:27[c]
Video games	1:13[a]	:49[b]	:26[c]
Print	:38[a]	:43[ab]	:43[b]
Movies	:25[a]	:25[ab]	:18[b]
TOTAL MEDIA EXPOSURE	10:45[a]	8:33[b]	7:29[c]
Multitasking proportion	29%[a]	26%[a]	16%[b]
TOTAL MEDIA USE	7:38[a]	6:21[b]	6:19[b]

What do we mean by communications revolution?

Two dimensions:

- An enormous capacity to *generate, integrate, manipulate and distribute* information across temporal, geographical and disciplinary boundaries.
- *Integration of different digital domains* – from university libraries to private data archives to research from scientific groups and labs, as well as information on people

Viswanath, 2011

The Communications Revolution

What are the consequences?

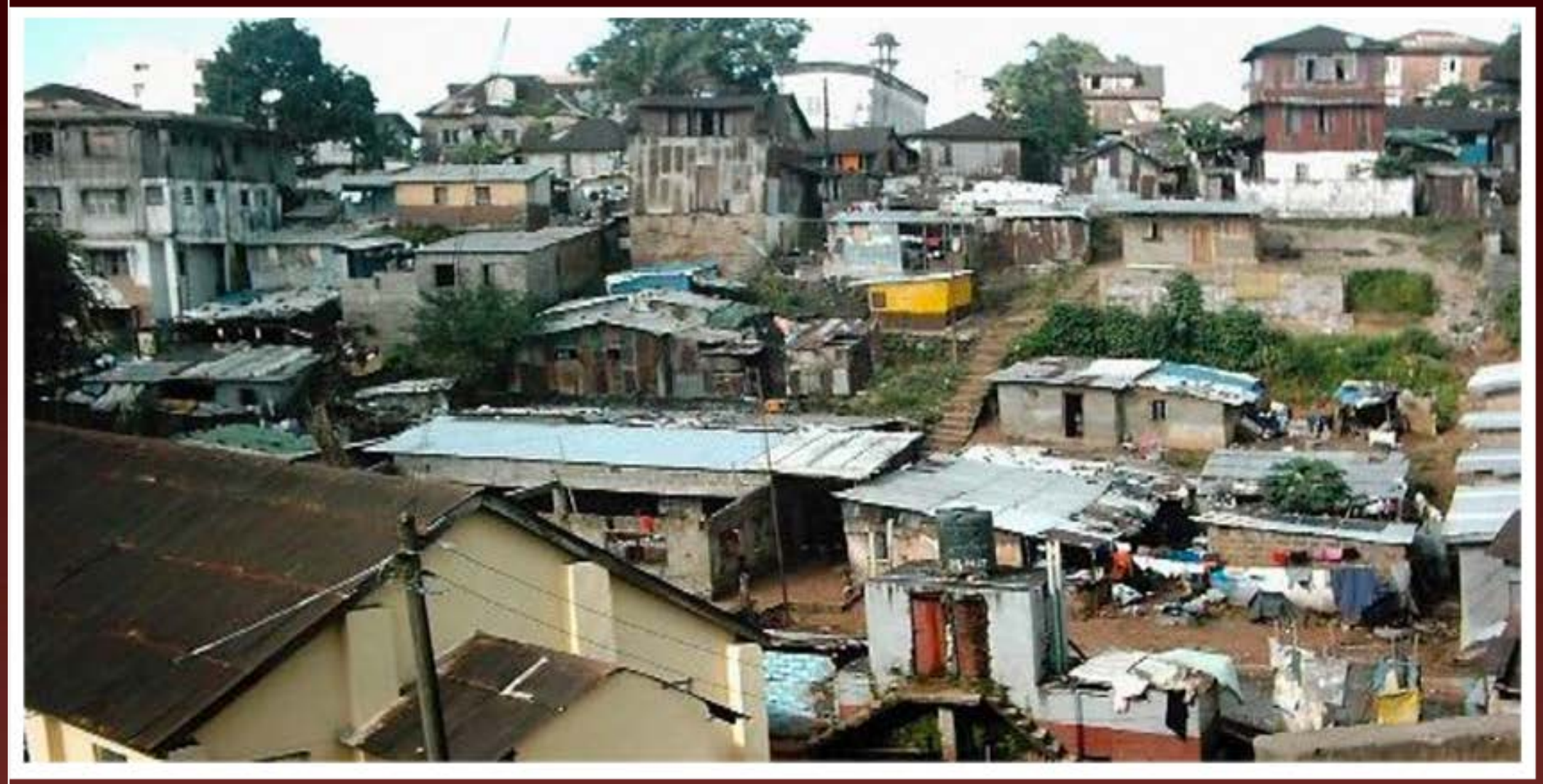
- Democratization of information whose generation and consumption at one time was limited by specialty and geography
- A shift from a command and control approach to more grass-roots, participatory models

Viswanath, 2011

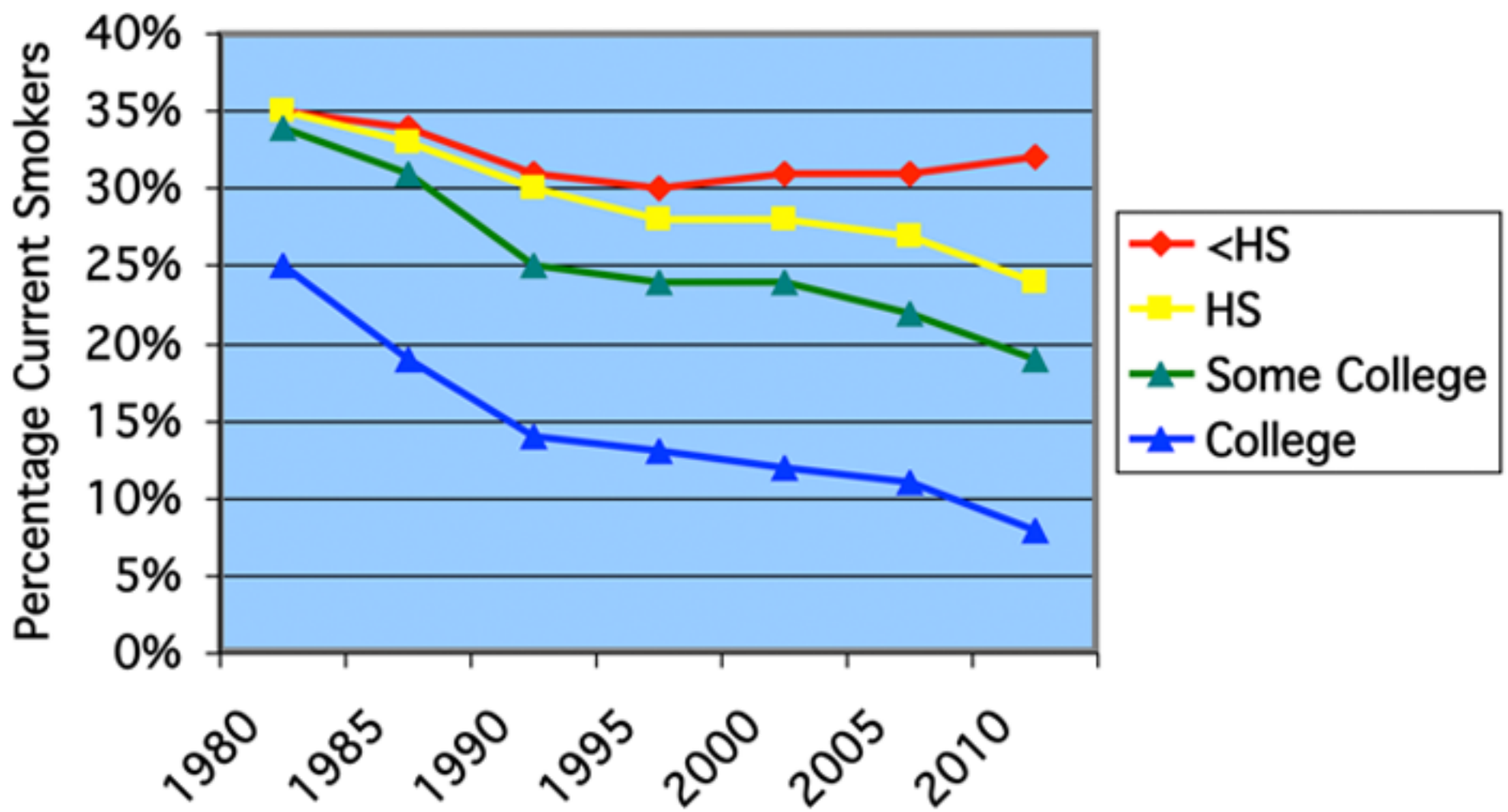
Health Disparities and Communication Inequalities

Living conditions

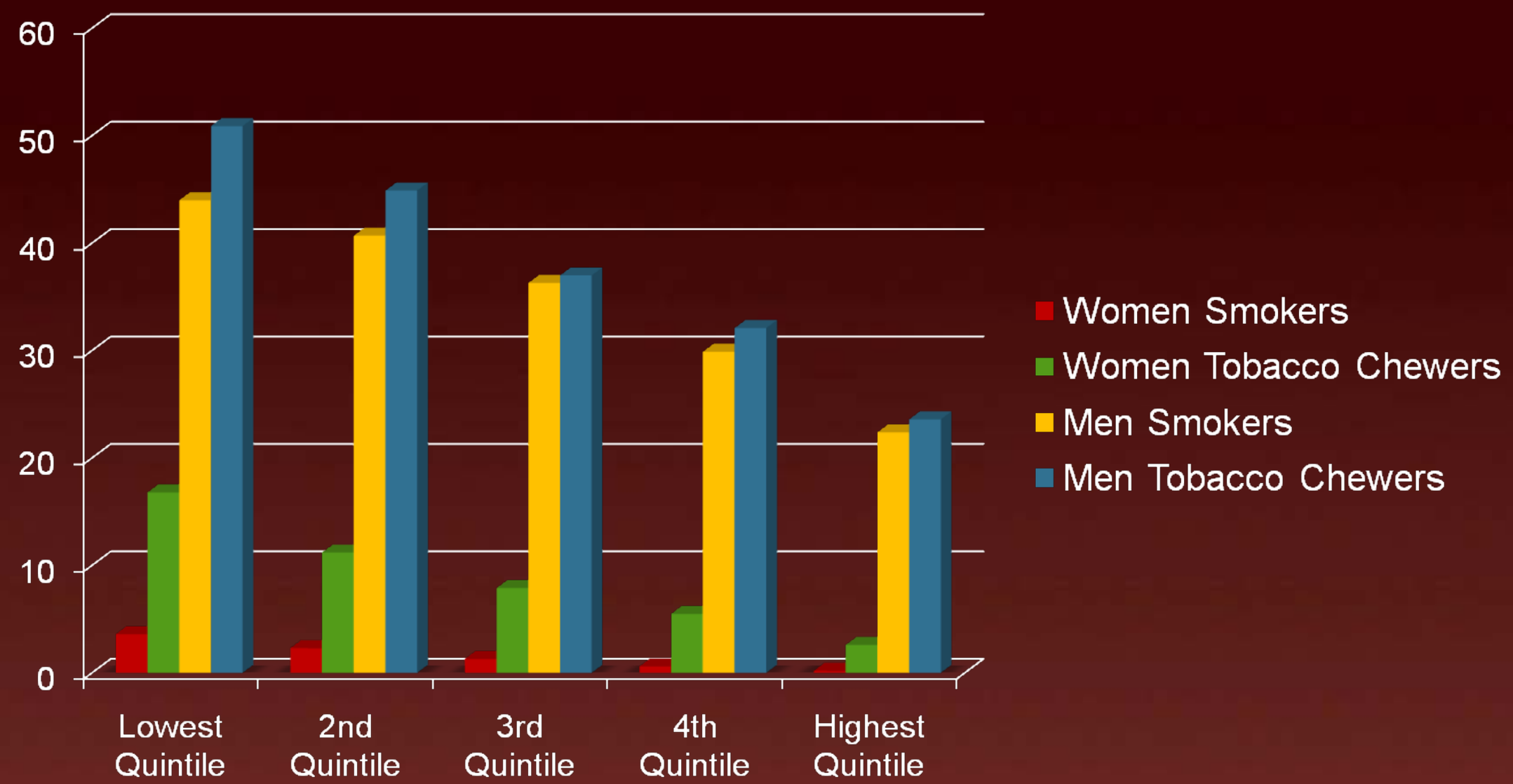
Living conditions



U.S. cigarette smoking prevalence by education level 1980-2010



Tobacco use by wealth in India



Viswanath et al., 2011

Social determinants

- Race/ethnicity
- Living conditions
- Socioeconomic status
  - Income
  - Education
  - Occupation
- Gender
- Sexuality
- Immigration status
- Stressful life events over the lifecourse

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Health Disparities: Social determinants framework

Social Determinants

Socioeconomic Position
- Education
- Income
- Employment
- Occupation

Place
- Neighborhood
- Urban versus rural

Health Outcomes

- Knowledge
- Health Beliefs
- Comprehension
- Capacity for action
- Incidence
- Health Behaviors
- Prevention
- Screening
- Treatment
- Survivorship
- End-of-life care

Structural Influence Model of Communication (SIM)

Social Determinants

Socioeconomic Position
- Education
- Income
- Employment
- Occupation

Place
- Neighborhood
- Urban versus rural

Mediating/ Moderating Conditions

Socio-Demographics
- Age
- Gender
- Race/Ethnicity

- Social Capital

- Resources

Health Communication

- Media Access
- Health Media Use & Exposure
- Information seeking
- Attention
- Information Processing
- Capacity to Use Information

Health Outcomes

- Knowledge
- Health Beliefs
- Comprehension
- Capacity for action
- Incidence
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Communication Inequality…

…is differences among social classes in the generation, manipulation, and distribution of information at the group level and differences in access to and ability to take advantage of information at the individual level.

Dimensions of communication inequality

Five broad dimensions

- Use/Access/Exposure
- Attention
- Information seeking
- Processing
- Communication Effects

Use/Access/Exposure

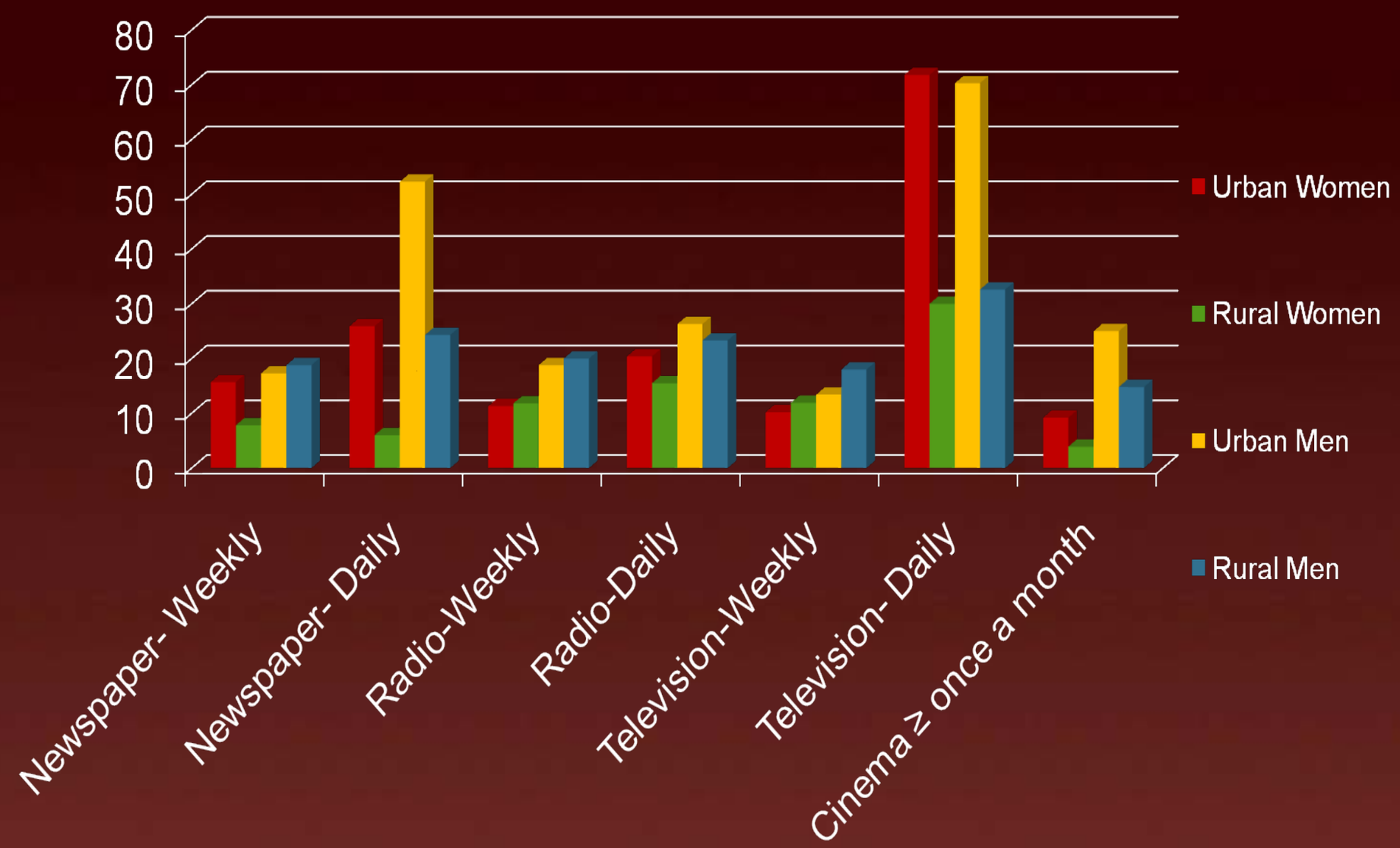
Recent work

Socioeconomic Status (SES), Race and ethnicity are associated with:

- Subscription to cable or satellite TV and the Internet
- Daily readership of newspapers
- Differential *time* with different media
- *Preferences* for different media
- *Attention* to health content in different media
- Processing (confusion) of health information
- Trust in media
- *Knowledge gaps* in health
- Intermittent smoking

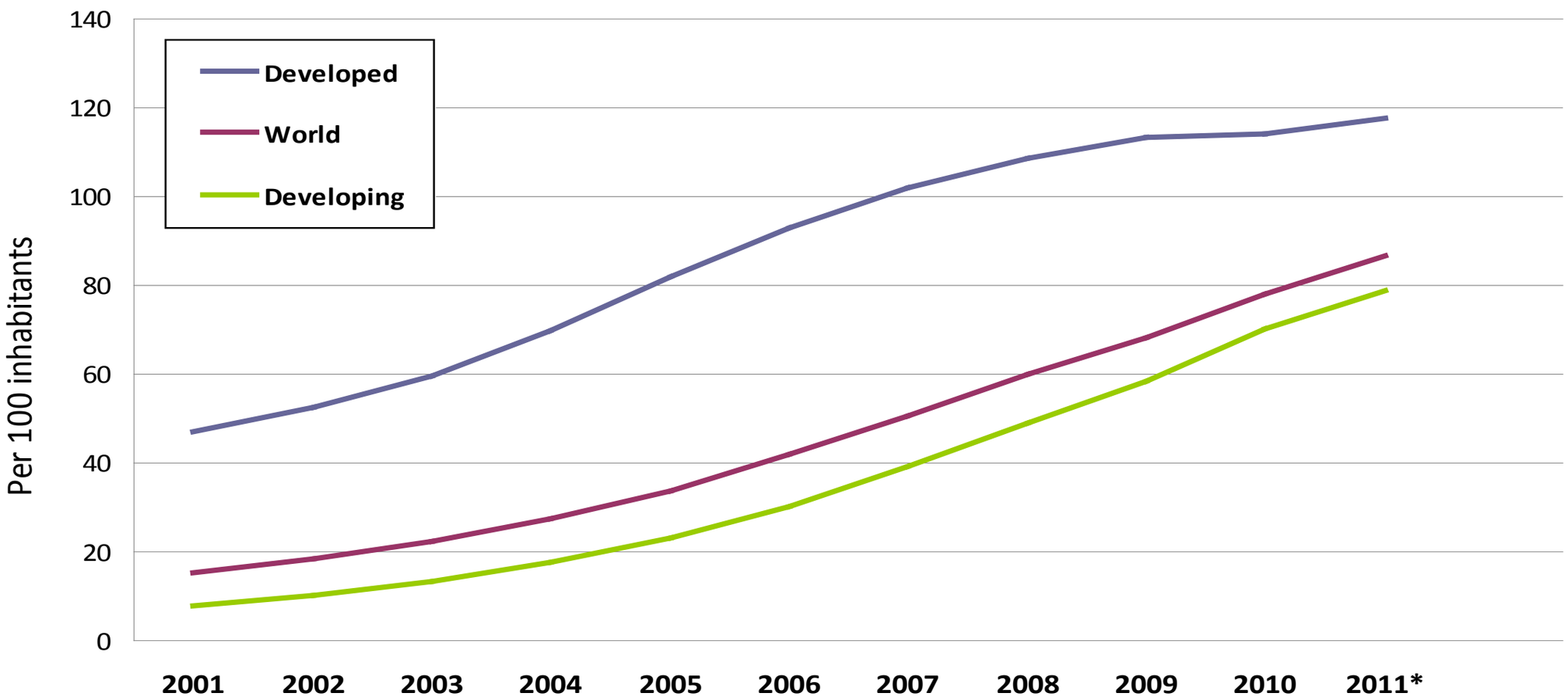
Viswanath, 2011; Kontos et al., 2011; Blake et al., 2010; Blake et al., 2011; Ackerson & Viswanath, 2009; Ramanadhan & Viswanath, 2006; Arora et al., 2008; Viswanath et al., 2006; Viswanath, 2006; Viswanath & Kreuter, 2007; Kontos, Bennett & Viswanath, 2007

Media use by location in India



Viswanath, Sorensen, Gupta & Ackerson, 2011

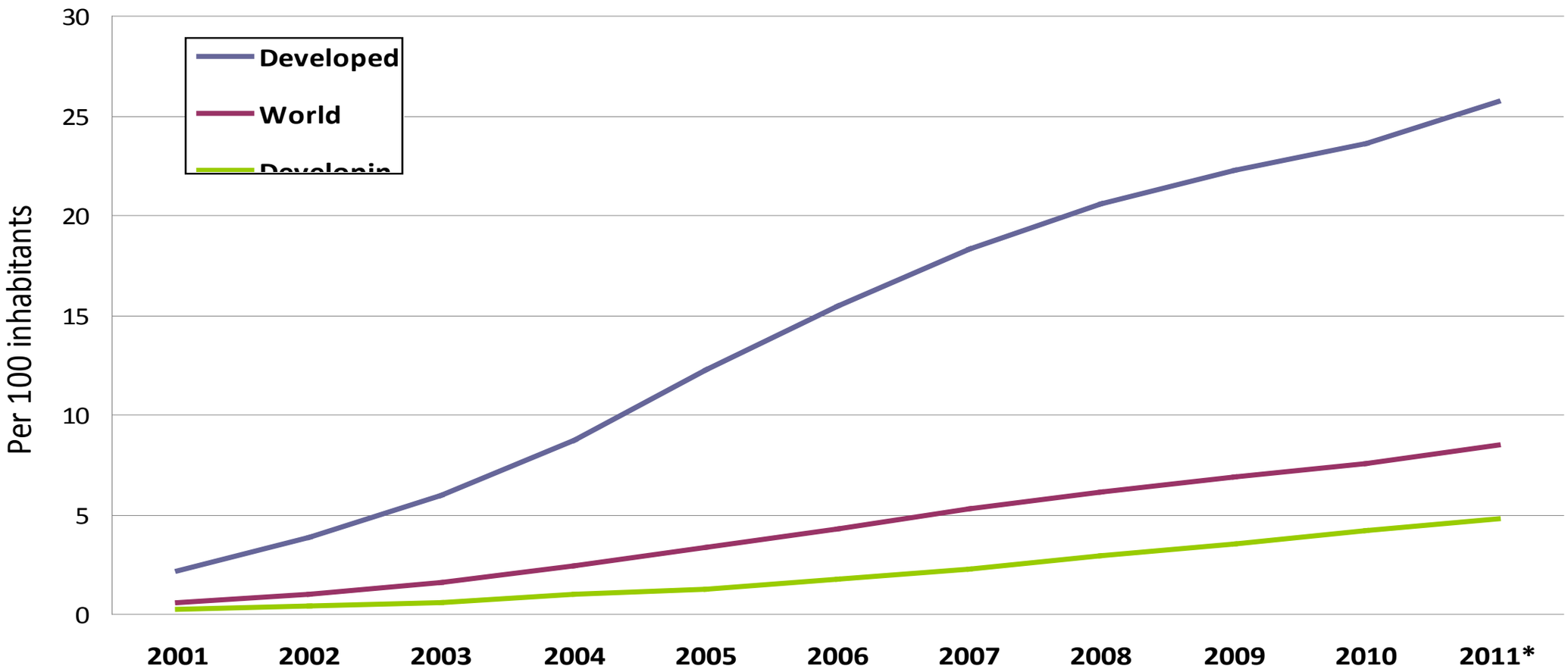
Mobile-cellular subscriptions per 100 inhabitants, 2001-2011*



* Estimate.
The developed/developing country classifications are based on the UN M49, see:
http://www.itu.int/ITU-D/ict/definitions/regions/index.html

International Telecommunication Union [Report on the Internet]. World Telecommunication/ICT Indicators Database. www.itu.int/ITU-D/ict/statistics/, Viswanath et al., 2011

Fixed (wired)-broadband subscriptions per 100 inhabitants, 2001-2011*



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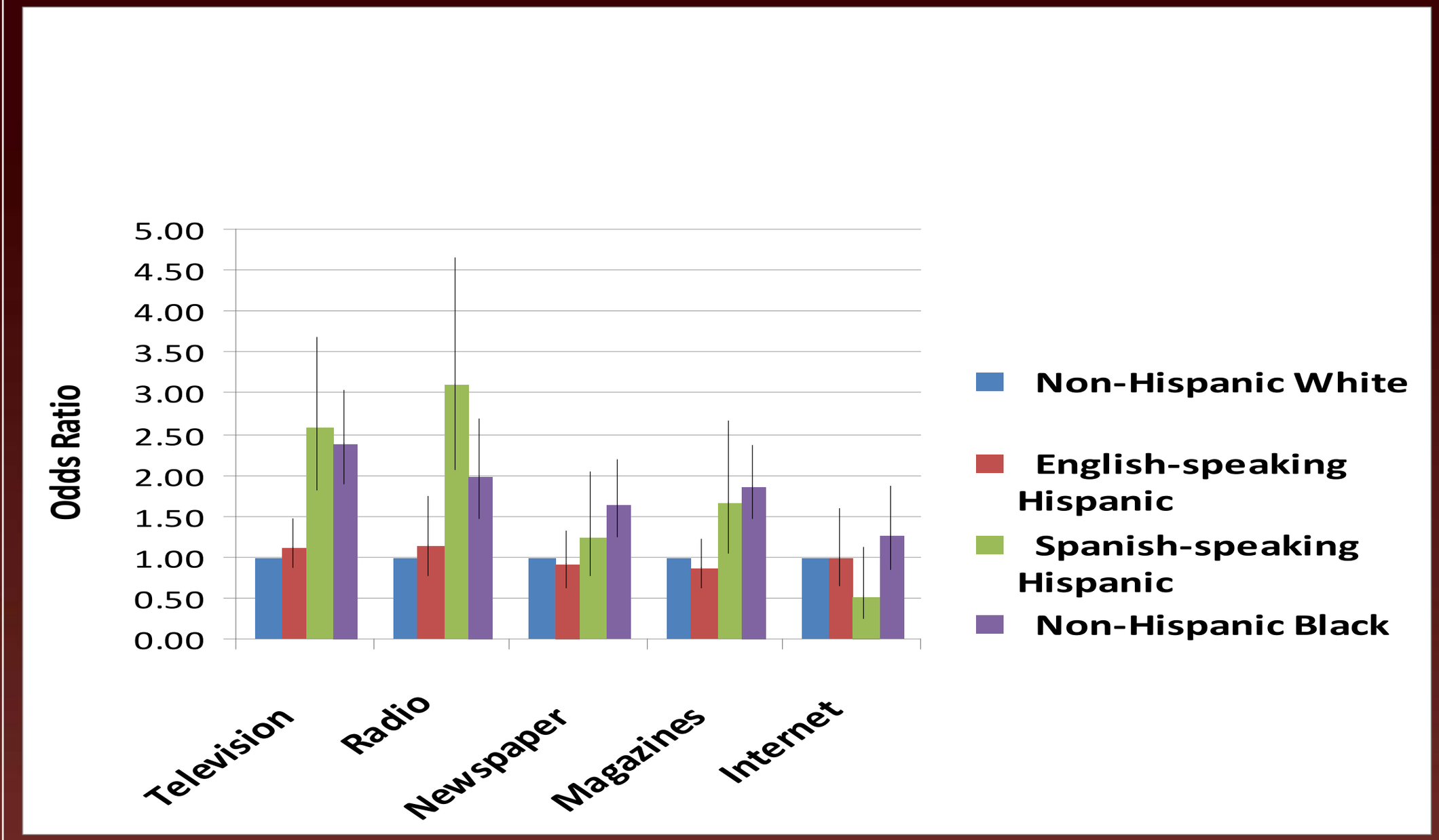
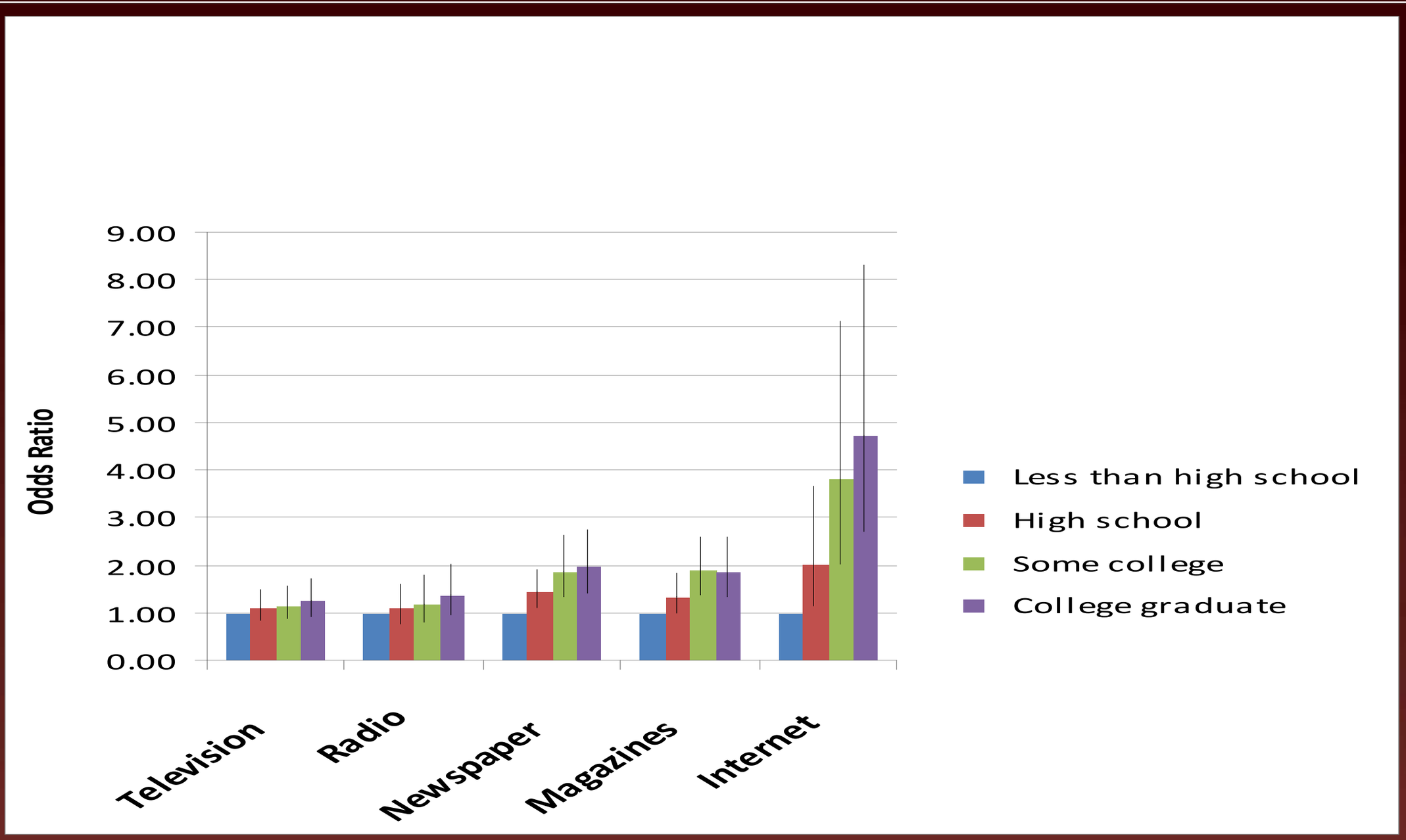
International Telecommunication Union [Report on the Internet]. World Telecommunication/ICT Indicators Database. www.itu.int/ITU-D/ict/statistics/, Viswanath et al., 2011

Attention to Health Information

Paying a lot of attention to health in the media by race/ethnicity, (HINTS 2005)



Paying a lot of attention to health in the media by education status, 2005

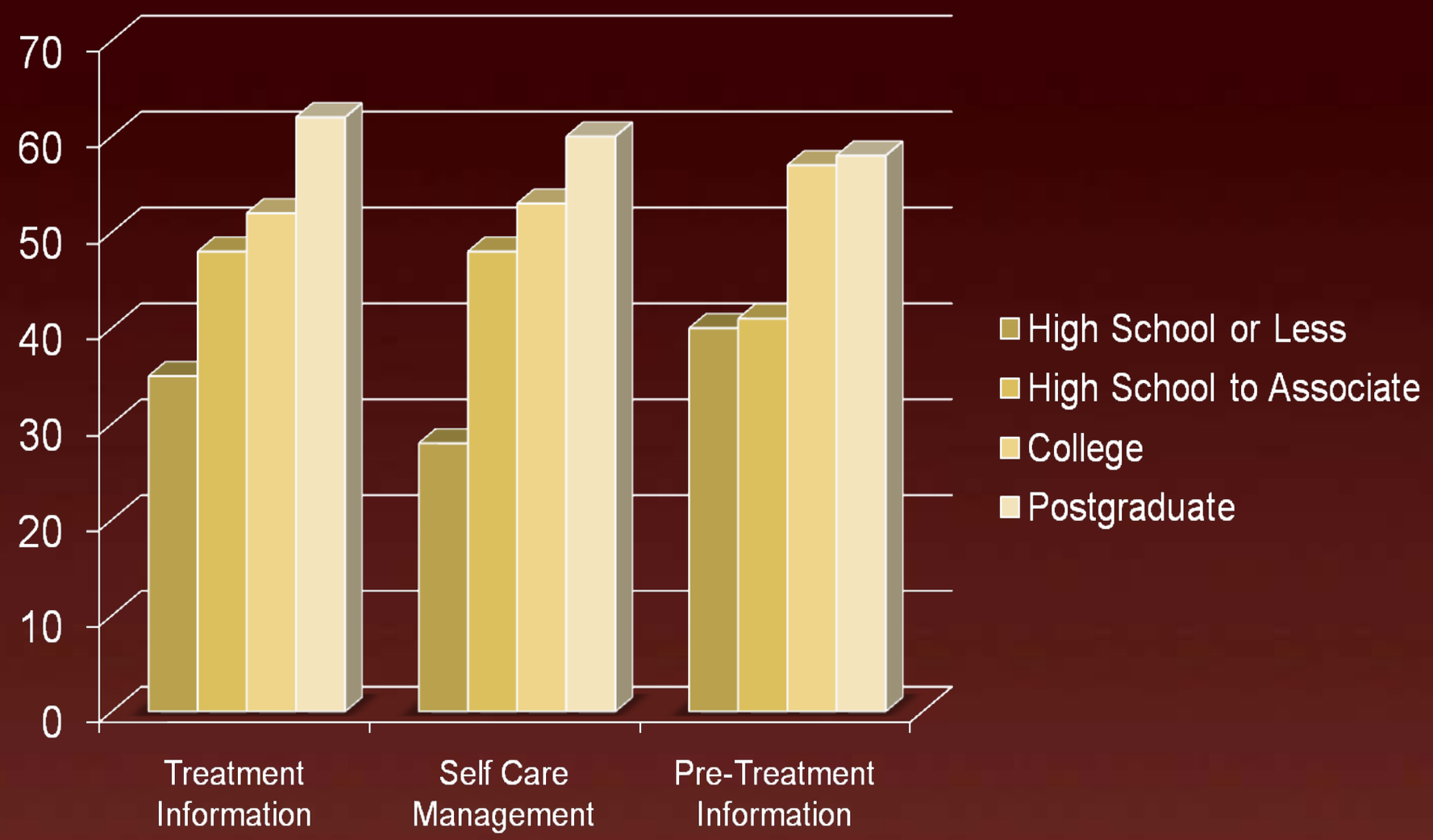


Information Seeking

Recently there has been an increased emphasis on

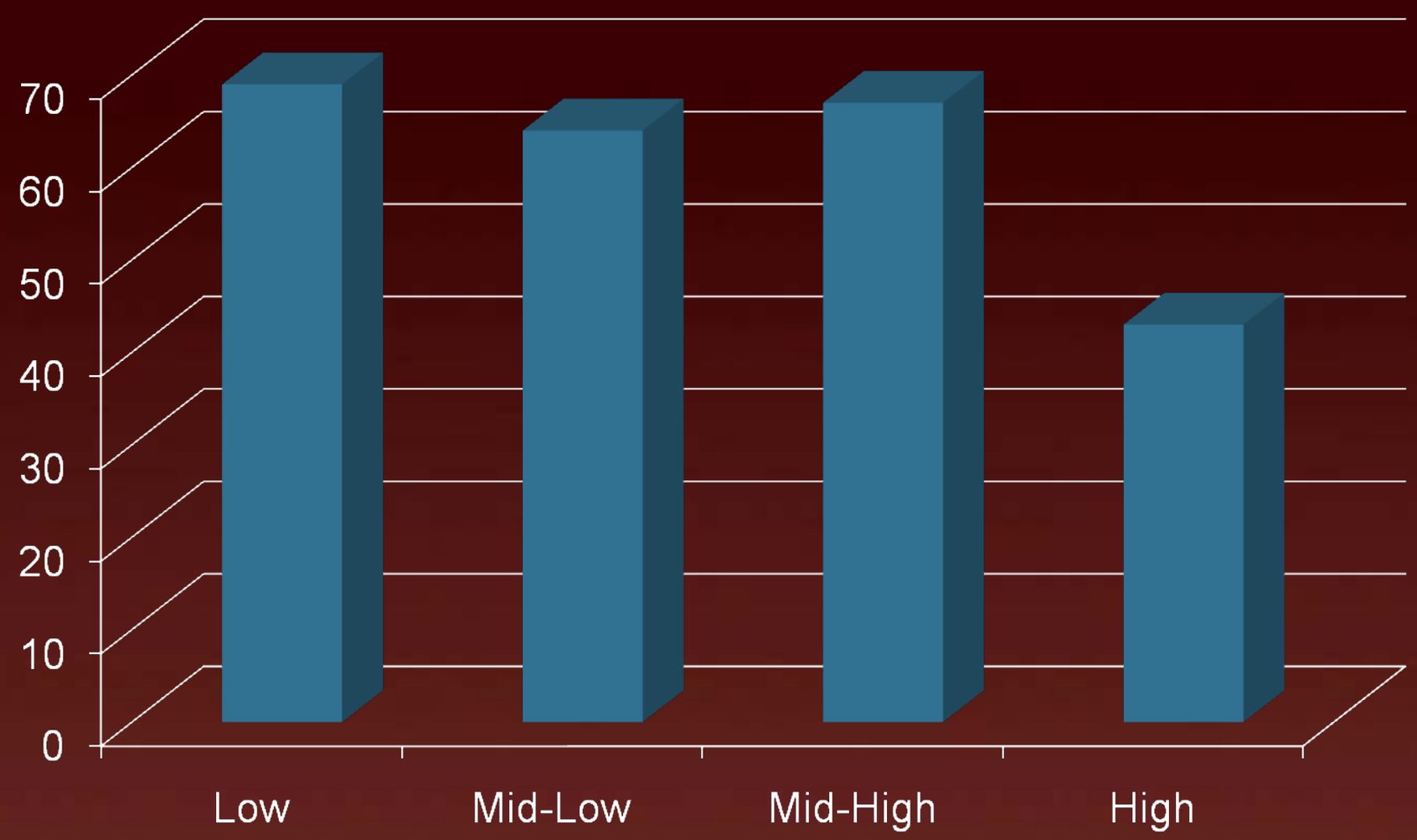
- Patients gathering information
- Carefully weighing evidence
- Taking into account their personal preferences and values in order to fully participate in clinical decisions

Types of information sought, by education



Galarce, Ramanadhan, Weeks, Schneider, Gray, Viswanath, 2011

Participants seeking work/finance information by level of wealth



Galarce, Ramanadhan, Weeks, Schneider, Gray, Viswanath, 2011

Likelihood of seeking

Treatment Information	Self-Care Management
Higher Education	Higher Education
Younger Age	Breast Cancer

Galarce, Ramanadhan, Weeks, Schneider, Gray, Viswanath, 2011

Likelihood of seeking

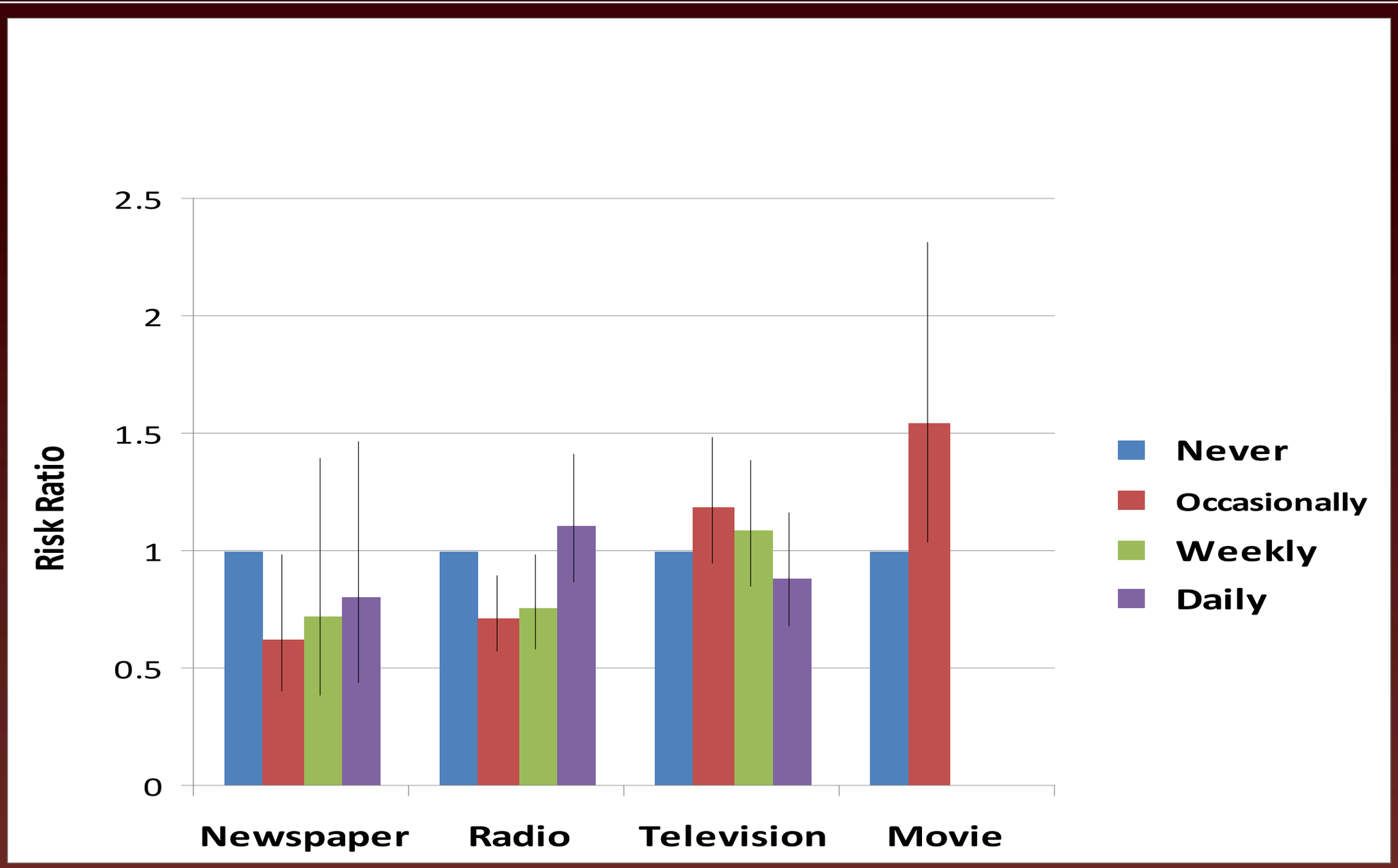
Health Services (Pre-Treatment) Information	Work and Finance Information
Higher Education	Younger Age Lower Wealth Index Higher Debt

Galarce, Ramanadhan, Weeks, Schneider, Gray, Viswanath, 2011

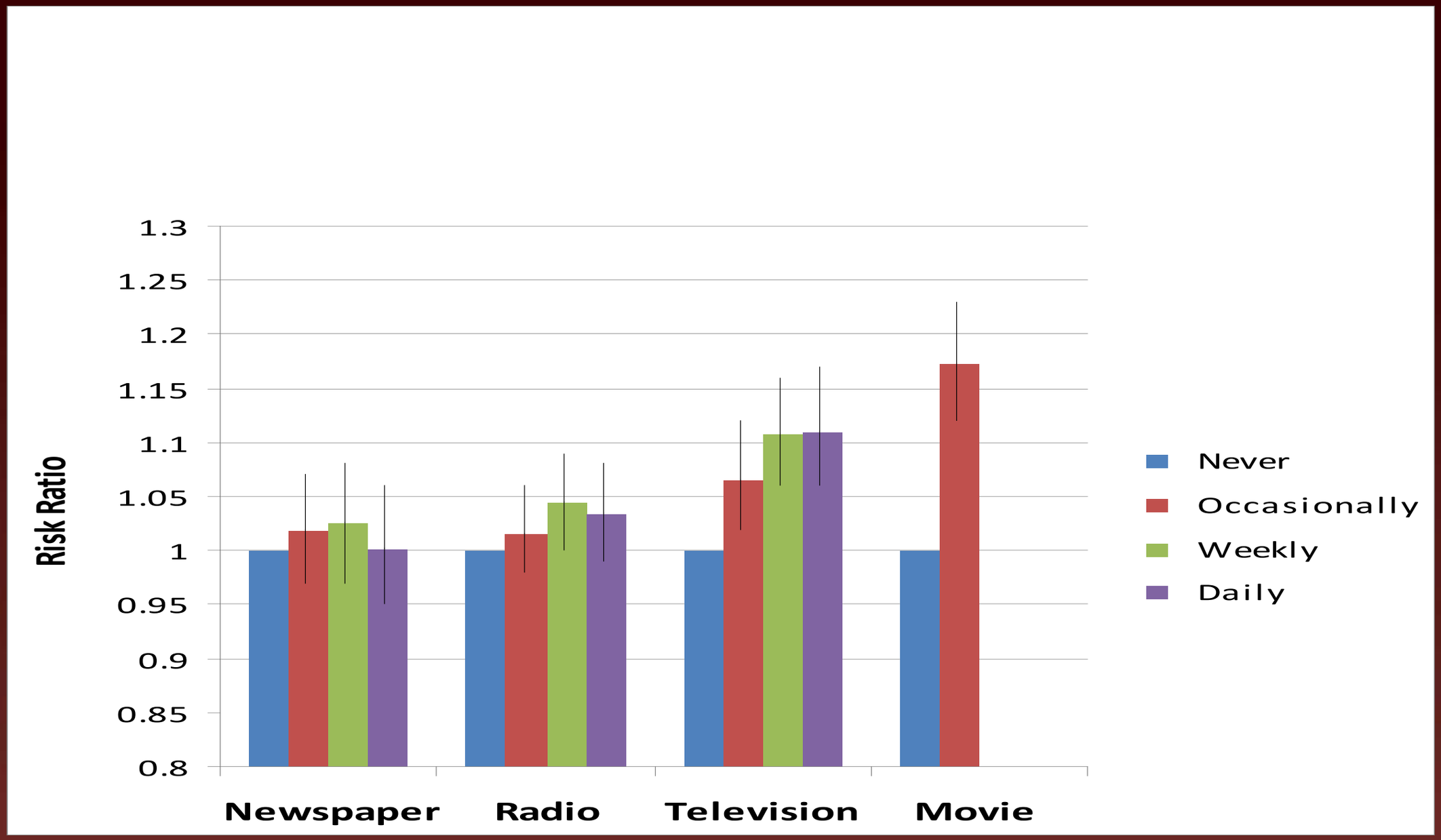
Communication Effects on Outcomes

- Knowledge gaps
  - Skin Cancer
  - Breast Cancer
  - Effects of Tobacco Use
- H1N1 Vaccination
- Light and Intermittent smoking

Risk of smoking by media use among Indian women, 2005-2006



Risk of smoking by media use among Indian men, 2005-2006



Potential solutions to address disparities: Four exemplar interventions

- Click to Connect (C2C)
  - Individual capacity building to promote internet literacy among the underserved
- Planet MassCONECT
  - Community-based organization's capacity building to promote adoption of evidence-based interventions
- Project IMPACT
  - Transform public agenda about health disparities by influencing Media agenda
- MassCONECT
  - Build community capacity to address disparities though intersectoral mobilization in three Massachusetts Communities

Much of this work is informed by the principles of Community-based Participatory Research (CBPR)

Variety of methods to examine and address inequalities

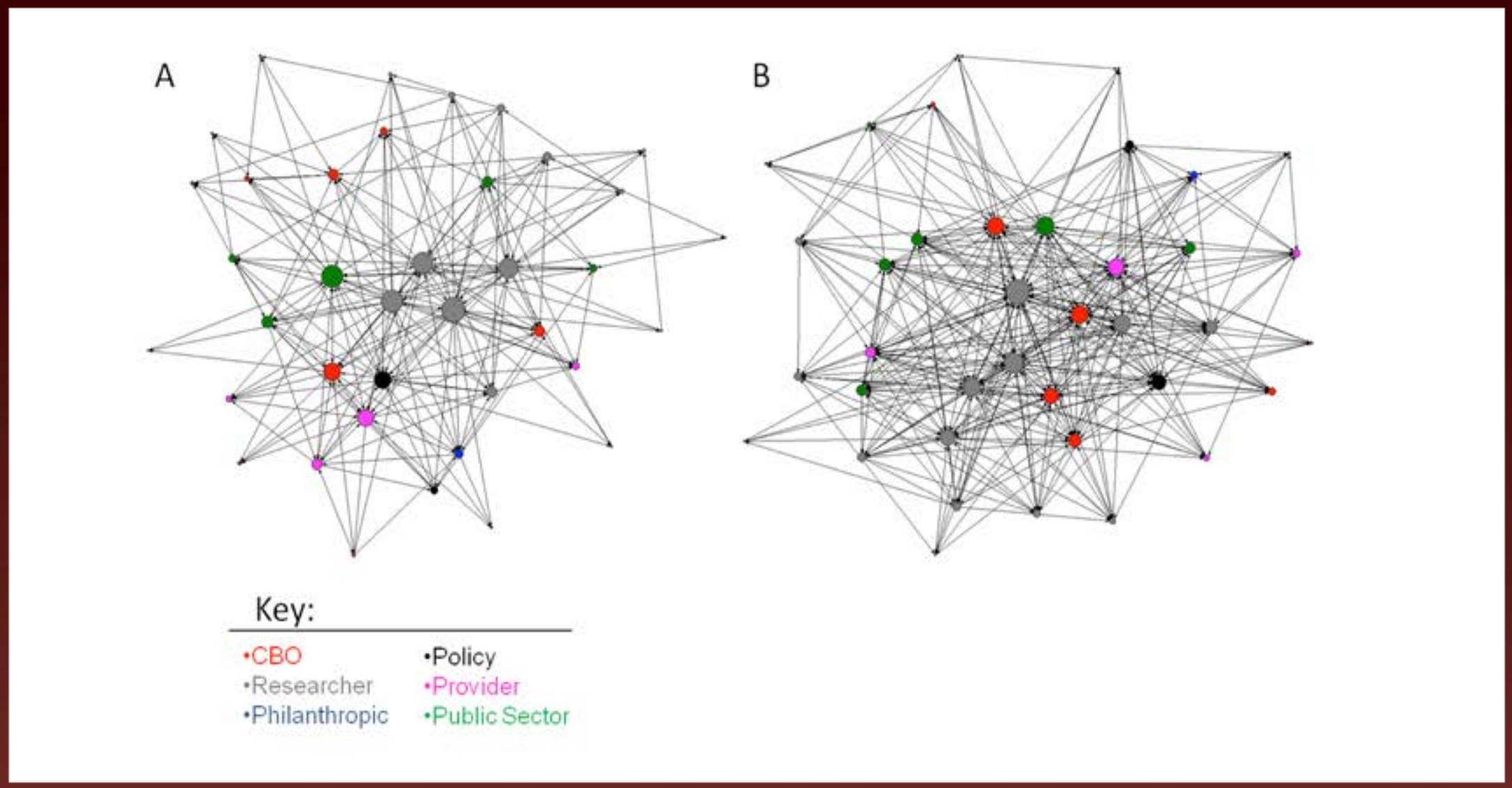
- Click to Connect (RCT)
  - Pre-post test surveys
  - Usability tests
  - Focus groups
  - Process data
  - Web tracking data
- Project IMPACT
  - Content analyses of media
  - Focus groups
  - Key Informant interviews
  - Public opinion surveys
  - Community Leadership Surveys

Variety of methods to examine and address inequalities

- PLANET MassCONECT
  - Census of health-related CBOs
  - Key Informant Interviews
  - Analyses of Implementation – Grant proposals
- MassCONECT
  - Social Network Analyses
  - Surveys
  - Key Informant Interviews
  - Focus groups

MassCONECT
Social Network Analysis

Connections among 38 MassCONECT members at network inception (panel A) and Year 4 (panel B).



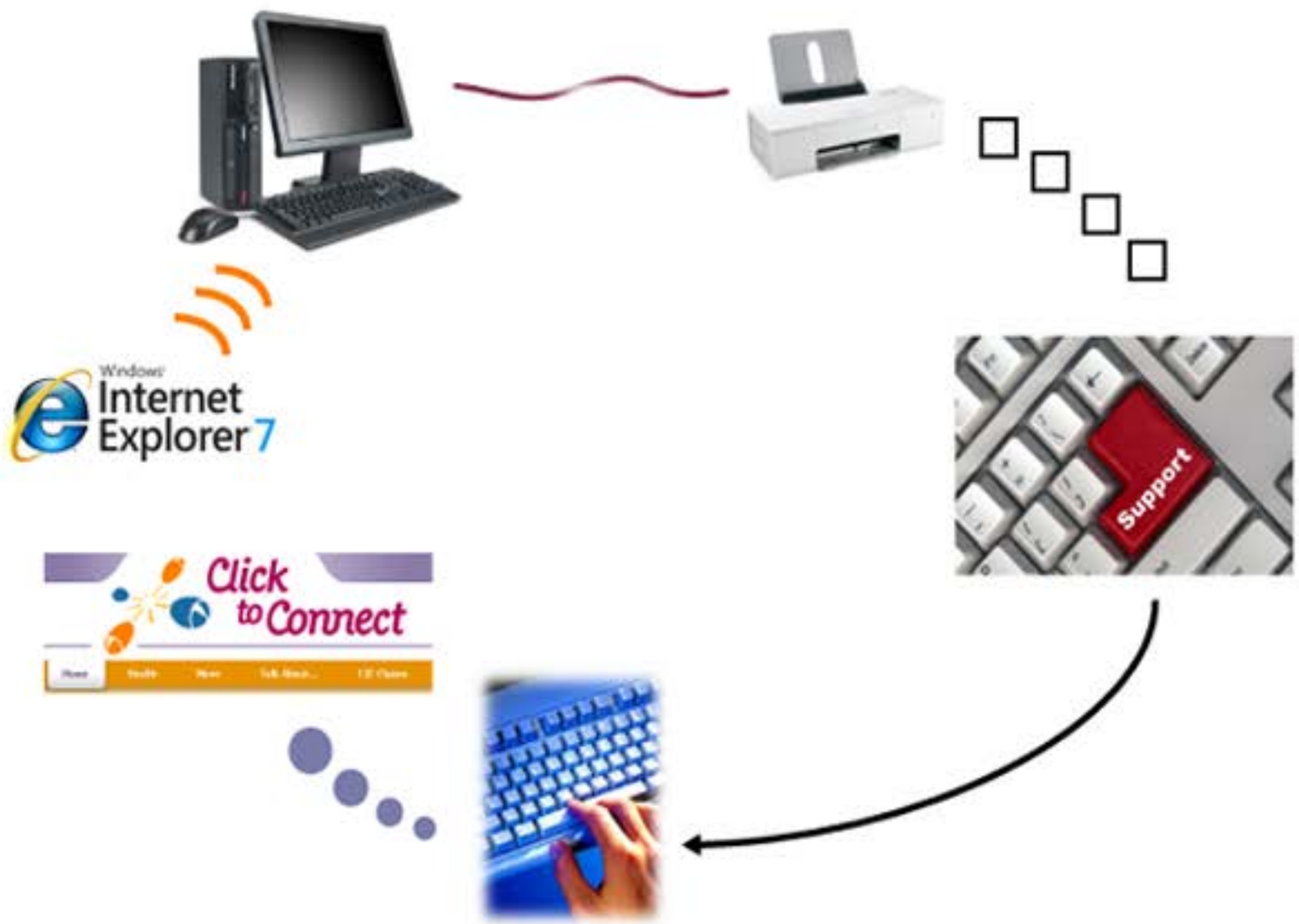
Ramanadhan et al., 2012

Click to Connect

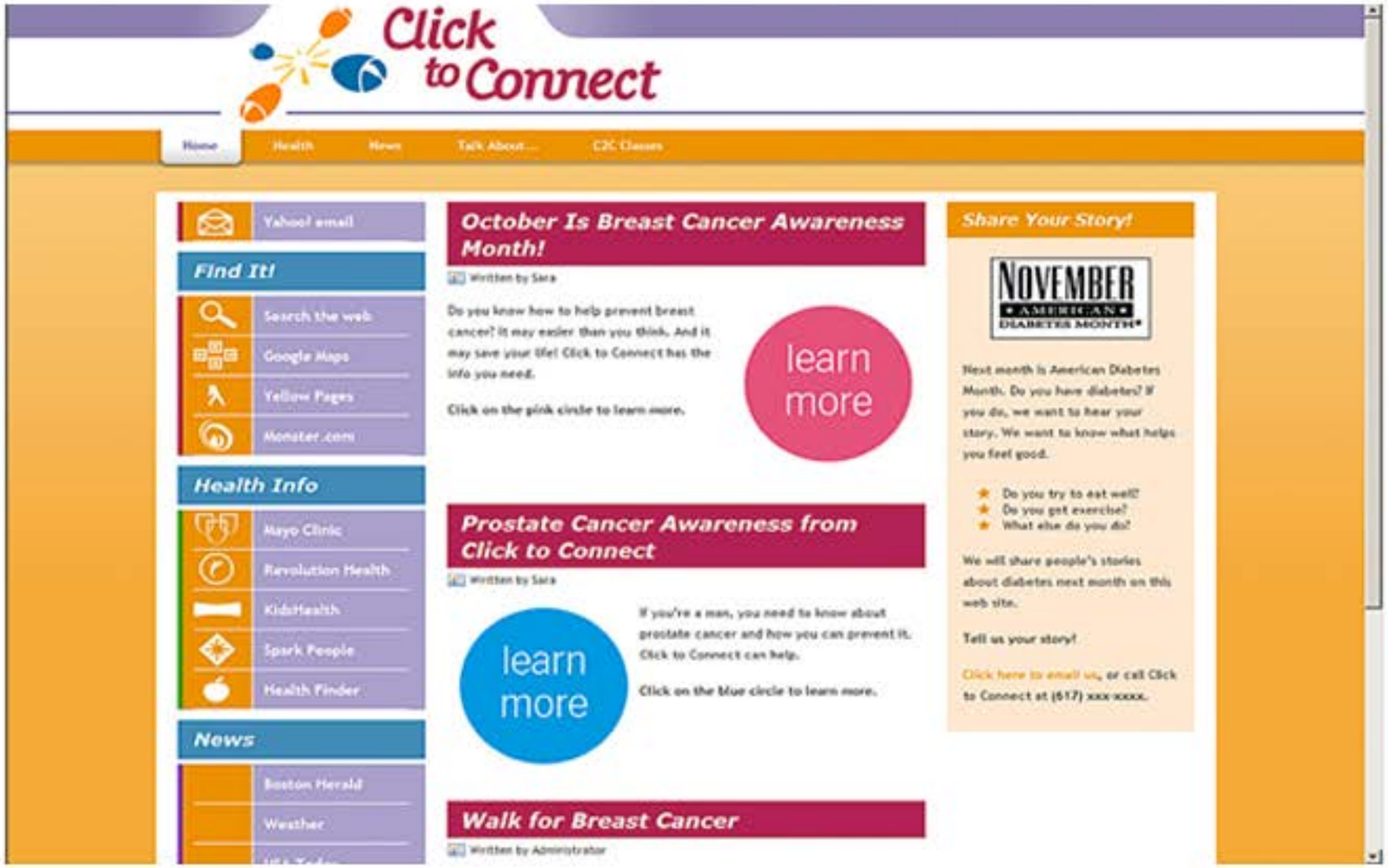
Does improving access and ability to use the Internet among low literacy, low SEP individuals lead to changes in several factors that comprise health literacy including:

- Primary Outcomes
  - Media use and exposure to health information
  - Internet use
  - Health information seeking and information efficacy
- Secondary Outcomes
  - Health knowledge and health beliefs

Click to Connect Intervention



Web portal: First iteration



Web portal: Final iteration

Click to Connect: Variety of Data

- Pre- and Post-intervention surveys
- Website tracking
- Monthly surveys
- ALL contact information: logs of visits, emails, calls and mail

Food Marketing

- The food and beverage industry spends approximately $2 billion per year marketing to children. **1**
- The fast food industry spends more than $5 million every day marketing unhealthy foods to children. **1**
- Kids watch an average of over ten food-related ads every day (nearly 4,000/year). **2**
- Ad spending for interactive video games is projected to reach $1 billion by 2014, with six million 3-11 year olds visiting some form of virtual game online each month.**3**
- Nearly all (98 percent) of food advertisements viewed by children are for products that are high in fat, sugar or sodium. Most (79 percent) are low in fiber. **4**

1 Kovacic, W. e. (2008). *Marketing food to children and adolescents: A review of industry expenditures, activities, and self-regulation: A Federal Trade Commission report to Congress.* Federal Trade Commission.2 Powell LM, S. R. (2011). Trends in the nutritional content of television food advertisements seen by children in the United States: Analyses by age, food categories, and companies. *Archives of Pediatric Adolescent Medicine* .
3 Chester J, M. K. (2009). *Digital marketing: Opportunities for addressing interactive food and beverage marketing to youth.* Berkeley Media Studies Group, Berkeley.
4 Story M, L. N. (2008). *Food and beverage marketing to children and adolescents research brief.* Robert Wood Johnson Foundation.

Food Marketing –Social Media

- Eleven of the twelve fast food restaurants with the highest sales in 2009 maintained at least one Facebook account during the period we analyzed.
- 33 Beverage makers have facebook pages.
- Coke is number with 34 million fans; Starbucks with 25 million fans
- **23 beverage makers have Twitter accounts; use it as a way to engage customers and make their site participatory**
- From @McCafeYourDay, 05/19/09
  - @xxxxxxx Sorry to hear that! I'd like to send you a card for a FREE McCafe if you'd like to give it another shot - send me a DM
- 11/12 top twelve fast food restaurants and 21 of 33 have have atleast one YouTube channel

Food Marketing and Social Media: Findings from Fast Food FACTS and Sugary Drink FACTS. Johanna Richardson, M.B.A. and Jennifer L. Harris, Ph.D., M.B.A. Rudd Center for Food Policy & Obesity at Yale University. Paper presented at American University Digital Food Marketing Conference November 5, 2011

Communication inequalities and public health: The future

- Communication inequality as ONE important determinant of health disparities
- Need more work on causal pathways from communication inequality to health disparities
- Inequalities are only likely to increase as ICTs evolve
- How do we involve the end-user in the designing our systems?
- How do we engage CBOs and institutions in Intervening on Communications?
- What kind of policies do we need to ensure that these inequalities are not exacerbated?

Members of the Lab
www.viswanathlab.org

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