

## Biomonitoring and Health Disparities – Emerging Opportunities

Clement Bezold

*Institute for Alternative Futures*

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The attached presentation entitled, “Biomonitoring and Health Disparities – Emerging Opportunities”, was presented at *Disparities in Health in America: Working Toward Social Justice*, June 24-30, 2006, M D Anderson Cancer Center.

### Notes to Accompany Slides

Slides	Topic
5- 10	Introduction on Disparities and the DRA (Disparity Reducing Advances) Project
15–16	Challenge of biomonitoring: the “bathroom scale problem
17-27	Growth of biomonitoring – range of possible platforms for biomonitoring
28-37	The diabetes epidemic; its tragedy and our mis aligned incentives (get paid to amputate a leg but not inspect a foot and prevent the need for amputation.) Includes results of expose from New York Times in January of 2006.
39-40	On the preventability of diabetes
48-58	Cancer and Biomonitoring
59-75	Biomonitoring for Prevention and Healthy Living
76	DRA Project Recommendations for promoting biomonitoring as a disparity reducing advance
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89-91	The DRA Project in 2006 and 2007

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# Disparities Reducing Advances Project

April 6, 2006 Alexandria, Virginia

## Biomonitoring and Health Disparities – Emerging Opportunities Clement Bezold, Ph.D.

For  
**Disparities in Health in America:  
Working Toward Social Justice**  
June 24-30, 2006

M D Anderson Cancer Center

Institute for Alternative Futures 

## Biomonitoring and Health Disparities – Overview

For some high disparity diseases, particularly cancer and diabetes, biomonitoring advances can be very significant. However biomonitoring by itself is not enough to make the difference.



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Disparities in Health in America:  
Working Toward Social Justice  
June 24-30, 2006

**M D Anderson Cancer Center**

**Social Justice – involves**

- **Understanding**
  - **Changing minds and hearts**
  - **Commitments, priorities & action**
- Equity = an issue, like slavery and women's rights, where society is changing its mind**

## Biomonitoring and Health Disparities – Topics

- The Biomonitoring Futures Project and the Disparity Reducing Advances Project
- Biomonitoring in the context of causes of disparities
- Cancer 2015; Diabetes 2015
- Advances in biomonitoring – diabetes, cancer and healthy living/prevention
- Accelerating biomonitoring as a disparity reducing advance



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## Biomonitoring Futures Project and the "DRA Project"

- These findings are from the "Biomonitoring Futures Project", funded by the Robert Wood Johnson Foundation, a component of of IAF's Disparity Reducing Advances Project



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## IAF's Disparity Reducing Advances Project

The DRA Project is a multi-year, multi-stakeholder project developed by the Institute for Alternative Futures (IAF) to identify and accelerate the most promising advances for bringing health gains to the poor and marginalized.



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# Disparities Reducing Advances Project

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## DRA Project Sponsors

National Cancer Institute, Center to Reduce Cancer Health Disparities  
Agency for Healthcare Quality and Research  
Robert Wood Johnson Foundation  
Florida Hospital  
University of Texas Medical Branch



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## DRA Project Partners

- Active Living by Design
- Alliance for Health Reform
- American Cancer Society
- American College of Nurse Practitioners
- Center for Information Therapy
- Center for Minority Health at the University of Pittsburgh
- Center for Public Health Practice at Emory University
- Central Florida Family Health Center
- Clinical Directors Network
- Corporate Office of Science and Technology (COSAT), Johnson & Johnson
- Detroit Medical Center
- Health Resources and Services Administration
- Henry Ford Health System
- Hill Health Center



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## DRA Project Partners

- Institute for Alternative Futures
- Institute for Community Health
- Institute for Healthcare Improvement
- Institute for the Elimination of Health Disparities at The University of Medicine and Dentistry of New Jersey
- Intercultural Cancer Council
- Leadership by Design, Inc.
- Maryland Department of Health and Mental Hygiene
- Medical Automation Research Center at the University of Virginia
- Planetree
- Prevention Institute
- Resource Center for Health Policy at the University of Washington
- Samueli Institute for Information Biology



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## Your Organizations are welcome to join the DRA Project

- The information presented here is available at
  - [www.altfutures.com/dra](http://www.altfutures.com/dra)
  - [www.altfutures.com/bfp](http://www.altfutures.com/bfp)
- If you and your organization are interested in becoming a DRA Project Partner – contact Clem Bezold or Sandra Tinkham at IAF ([stinkham@altfutures.com](mailto:stinkham@altfutures.com)).



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## Why the DRA Project Is Important

- Health disparities are significant
- They are not perceived by most in the US
- Pursuit of equity (fairness) is a trend, like slavery and women's rights, that will take time and support, but can be accelerated
- Equity in: WHO Health For All, Healthy People 2010, IOM's Crossing the Chasm Report
- There will be advances – some of which can be identified and accelerated to reduce disparities
- The DRA Project, using us – the DRA Partner Network and those we affect – can do this.



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## Initial List of Disparity Reducing Areas & Specific Advances

# Disparities Reducing Advances Project

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## Initial Advance Areas to Consider

- Community health and prevention
- Better quality health care – More effective, caring treatment
- Complementary and alternative approaches
- Risk Identification
- **Biomonitoring/Bioinformatics**
- Behavior coaching/reinforcement



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## Biomonitoring in the context of causes of disparities

- The most important factors needed to reduce health disparities include:
  - Elimination of poverty
  - Meaningful jobs paying a living wage
  - Effective education through 12<sup>th</sup> grade
  - Universal access to effective health care
- We recognize these, but they are beyond the scope of the DRA Project, which is focusing on key advances in health care and public health
- In key diseases early detection of the disease or predisease states, in affordable, culturally appropriate, and sustainable ways can be significant in reducing disparities.



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## When Biomonitoring is not enough

- There is an important biomonitor that is inexpensive, easy to use, commonly available. It provides important information on risk factors for cancer, diabetes, and a variety of other diseases. It also is important for managing diabetes.
- But is often ignored



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## "The Bathroom Scale Problem"

- Where biomonitoring requires change it may be ignored.
- The bathroom scale is low cost, easy to use, widely available. Its results are significant for preventing or treating many diseases. Yet weight and the resulting BMI score are often not acted on.
- Biomonitoring needs to be connected to behavior change as relevant.



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## The Biomonitoring Futures Project

- Biomonitoring is one area of disparity reducing advance. The Robert Wood Johnson Foundation has provided funding to consider the future applications of biomonitoring and its role in reducing health disparities.
- The BFP is a component of the larger DRA Project.



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## Biomonitoring Futures Project

- Focus of the project:
  - Cancer (esp. breast, lung & colon)
  - Diabetes
  - Prevention/Healthy Living
- Findings of BFP Research, including
  - Diabetes and Cancer 2015
  - Health Information Systems 2015
  - Emerging biomonitoring platforms

Papers available at [www.altfutures.com/BFP](http://www.altfutures.com/BFP)




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**Disparities Reducing Advances Project**  
**April 6, 2006 Alexandria, Virginia**

# The Future of Biomonitoring Platforms

Biomonitoring Futures Project



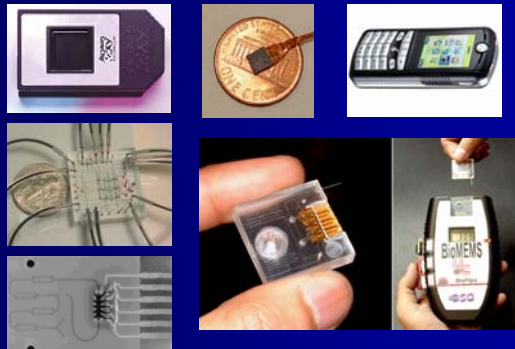

*Bill Rowley, M.D.*  
 Institute for Alternative Futures



## Biomonitoring Platforms






## Biomonitoring Platforms

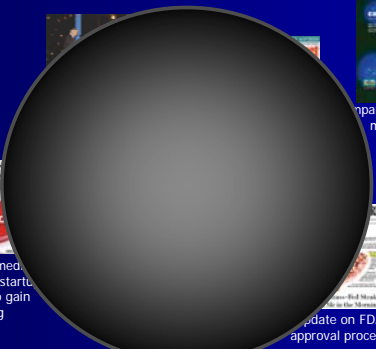



## Biomonitoring Platforms

- Portable – point of care or home
- Easy to use
- ~ Painless
- Fast result
- Reliable
- Data captured
- Inexpensive?

## How Would One Know?




Concept in research journal

Company marketing material


Optimistic media release from startup company to gain funding

Update on FDA approval process



## The hurdles

- Develop an idea to solve a problem
- Find the revenue
- Do the science & engineering
- Clinical trials – evidence of effectiveness
- Possibly regulatory approval
- Marketing
- Acceptance by physicians, payers, patients



# Disparities Reducing Advances Project

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## The hurdles

**Value for improving health and reducing disparities**

- Does it work – where is the evidence?
- Does it fit into care delivery or daily life?
  - Easy to use
  - Little discomfort or hassle
  - Fast, reliable results
  - Makes it easy for action to be taken
  - Culturally appropriate
  - Low cost
  - Compatible with information technology

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## Uses

- Predictive medicine – forecast disease
- Prevention
- Screening
- Behavior Modification
- Definitive Diagnosis
- Effective Disease Management
  - Empowering patient self-care
  - Selecting appropriate therapies
  - Confirming therapy is effective
  - Identifying relapses or complications
  - Help with prognosis

**Doing any of these things well should help improve health and reduce disparities**

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## Which will be the biomonitoring winner by 2015?

■ Blood spot	■ Chemistry
■ Breath tests	■ Electrical
■ Imaging tests	■ Genome
■ Saliva tests	■ Light
■ Serum	■ Lipids
■ Skin tests	■ Metabolome
■ Stool tests	■ Organisms
■ Tissue tests	■ Proteome
■ Urine tests	■ VOCs
■ Others	■ Etc...

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## Consider Diabetes

**A paradigm of the problem and the opportunities**

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## NYC's Stealth Epidemic

- 800,000 New Yorkers have diabetes
- Prevalence 30% higher than U.S.
- New cases occurring twice as fast
- One in three children will get diabetes
  - One in two for Latino and Black women
- North of 96<sup>th</sup> street 20% have diabetes; South the prevalence is 1%
- 30% don't know they have the disease
  - 2/3 who do know aren't doing enough to treat it
- Half of hospitalized patients are diabetic

IAF N.R. Kleinfield, Diabetes and Its Awful Toll Quietly Emerge as a Crisis, NYT, 1/3/06 and Living at the Epicenter of Diabetes, Deafness and Deafwar, NYT, 1/10/06 29

## Diabetes in the U.S. in 2025

**If we don't change...**

- 50 million with diabetes
- 45 million pre-diabetics
- Annual new cases of serious morbidity:
  - 70,000 blind
  - 119,000 renal failure on dialysis
  - 239,000 lower extremity amputations
- 622,000 deaths contributed by diabetes
- \$351 billion direct & indirect cost

IAF Rowley & Bezold, Diabetes Forecasts to 2025 and Beyond: The Looming Crisis Demands Change, 2005 30



# Disparities Reducing Advances Project

## April 6, 2006 Alexandria, Virginia

### Diabetes in the U.S. in 2025

#### Why is there an epidemic of diabetes?

- Diabetes is tied to the epidemic of obesity
- 2/3 of Americans are overweight; 1/3 obese
- Lifetime risk white men: women:
  - 92% overweight
  - 81% overweight
  - 49% obese
  - 48% obese
- 15% adolescents overweight  
- 23% of Blacks & Hispanics
- 50% of childhood diabetes now type 2

KM Flegal, Prevalence and Trends in Obesity Among US Adults, 1999-2000, JAMA, 2002  
 Vasan, Estimated Risks for Developing Obesity in the Framingham Heart Study, Ann Intern Med, 2005  
 Ogden, Prevalence and Trends in Overweight Among US Children and Adolescents, JAMA, 2002

### Diabetes in the U.S. in 2025

	Risk of Diabetes	Life Years Lost (Onset @ 30)	Quality Adjusted Life Years Lost
<b>MALE</b>			
White	27%	13 yrs	22 yrs
Black	40%	17 yrs	24 yrs
Hispanic	45%	15 yrs	24 yrs
<b>FEMALE</b>			
White	31%	16 yrs	25 yrs
Black	49%	20 yrs	28 yrs
Hispanic	53%	14 yrs	25 yrs

### Preventing Diabetes?

#### Prevention

#### 41 Million with Pre-diabetes

- 50% will develop diabetes within 10 yrs
- Diabetes can be prevented 58% of time
  - Loss 8-15 pounds
  - 30 minutes of activity 5 times a week
- Yet usually not screened and little urgency in managing prediabetes

### Treating diabetes in NYC

#### Chronic Disease Management

	Endocrinologist	Ophthalmologist	Diabetes Educator	Nutritionist	Podiatrist
Fee	\$200	\$300	\$70	\$70	\$150-200
Reimburse	\$100	\$225	\$15-30	\$15-30	\$30-90
Cum Loss	\$100	\$175	\$215-230	\$255-285	\$375-395

(Based on average charges in New York City and Medicare reimbursement rates)

**3/4 of New York's hospital diabetes centers forced to close because they failed to make money**

### Treating diabetes in NYC

	Doctor Visit	Outpatient Diagnostics	Hospitalization	Physical Therapy	Prosthetic Leg
Fee	\$53	\$145	\$7,733-17,594	\$160	\$11,668
Paid	\$81	\$214	\$19,093	\$117	\$12,923
Profit	\$28	\$69	\$1,449-11,360	\$-43	\$1,255

**System encourages people to get sick and then providers get paid for treating them!**

### Treating diabetes in NYC

**9-12 year delay in diagnosis**

**20% already have eye, nerve or kidney damage by time diagnosed**

**90% of diabetics don't know their HA1c scores**

**Lack of urgency - takes ~ 6 months to address abnormal HA1c**

**Medicaid pays for one visit a day; nurse call for checkup not paid; insurance pays for 1 test strip/day**

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## Treating diabetes in NYC

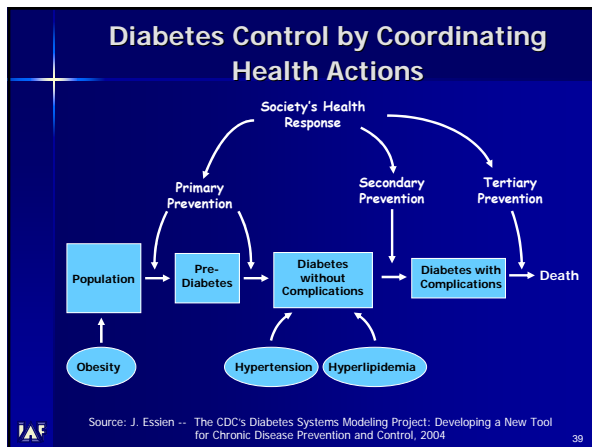
- "Diabetes centers closed because they failed to make money"
- "As the epidemic of diabetes has grown, more than 100 dialysis centers have opened in the city"
- "Patients don't test their blood as often as they should because they can't afford the equipment"
- "Patients wait months to see endocrinologists"
- "Insurers limit diabetes benefits for fear they will draw the sickest, most expensive patients"
- "Until we address the financing & reimbursement structure, this disease is going to rage out of control"

Jan Urbina, In the Treatment of Diabetes, Success Often Does Not Pay, NYT, 1/11/06 37

## Preventing Diabetes

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## Preventing Diabetes

**The diabetes prevention trial of NIH showed that 58% of individuals at high risk for diabetes could prevent conversion to Type 2 diabetes (a life-long chronic disease with complications such as blindness, amputations and kidney failure.)**

Source: Prescription for a Healthier Michigan, May 2004 40

## How will we as a society solve the diabetes problem in the future?

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## The History of Health 2025

- Prevention
- Screening
- Behavior modification
- Effective management of chronic diseases
- Empowered patient self-care
- Advances in biotechnology and information
- Personalized medicine
- Access to care
- Address the obesogenic environment
- Address social determinants of health

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## Type 2 diabetes

Component of Management	Role for Biomonitoring
Forecast Risk	Gene patterns, including mitochondrial genes Possibly protein or metabolic patterns
Prevention	Information and coaching for healthy living – diet and exercise
Screening	Identify prediabetes, diabetes, dyslipidemia hypertension
Behavior Modification	How well controlling HgA1c, lipids, BP
Disease Management	Easy testing with rapid results at point of care
Patient self-care	Biomonitoring to help management - wireless capture and longitudinal record

## Glucose Biomonitoring

## Glucose Biomonitoring

**NSTI Nanotech 2006**  
Boston, Massachusetts, May 7-11, 2006

- Polymerized Crystalline Colloidal Arrays Photonic Cosmetic Contact Lenses
- Detection of Glucose and other Biomedical Analytes on Biosensor Surfaces using Fractal Analysis
- A glucose Biosensor Encapsulated in Erythrocytes
- Carbon Microstructures for Glucose Biosensor
- New Biosensor Technologies: Your Personal, Portable and Always On-call Physician

## Glucose Biomonitoring

I am convinced we will have a noninvasive glucose monitor before 2015  
But I do not know which platform technologies will succeed  
**Bill Rowley, MD, IAF**

*Whichever becomes available, we must make sure it is leveraged to reduce health disparities*

## Biomonitoring & Behavior

### Games & Reinforcement

*How do we leverage biomonitoring to improve compliance and change behavior?*

# The Future of Biomonitoring for Cancer

Biomonitoring Futures Project

*Bill Rowley, M.D.*

Institute for Alternative Futures

# Disparities Reducing Advances Project

## April 6, 2006 Alexandria, Virginia

### Cancer Burden

- Leading cause of death for those < 85
- ½ of men and 1/3 of women will develop cancer during lifetime
- 1,373,000 new cases of cancer this year
- Death rates now dropping ~ 1% per yr
- Still 570,300 will die of cancer this year
- Lung cancer
  - 172,500 new cases expected in 2006
  - Biggest killer – 163,500 deaths in 2006
  - Incidence declining for men, level for women

### Cancer Burden

- Breast cancer
  - Most common female cancer – 211,000
  - Second leading cause of death – 40,400
  - Incidence ↑ 0.3% per year
  - Mortality ↓ 2.4% per year
- Colon cancer
  - Third most common – 145,300
  - Second most deadly – 56,300
  - Incidence and death rates declining

### Cancer

Component of Management	Role for Biomonitoring
Forecast Risk	Gene and protein patterns correlated with cancer risk
Prevention	Information and coaching for healthy living – diet, exercise, not smoking, etc.
Screening	Identify pre-cancer, cancer
Behavior Modification	Quit smoking
Disease Management	Identify cancer subtype and pharmacogenomics for personalized Rx; Monitor effectiveness of Rx & recurrence
Patient self-care	Testing with wireless capture and longitudinal record; ideal if non-invasive

### Screening Compliance

- Mammogram
  - 61.5% of women over 40 had one last year
  - 43% if didn't finish high school
  - 28.9% if no insurance coverage
- Stool Fecal occult blood testing
  - 19% over 50 y/o had test last year
  - 9.3% if no health insurance (<65 y/o)
- Colonoscopy in past 5 years
  - 45.6% of over 50 y/o had test
  - 18.8% if no health insurance (<65 y/o)

American Cancer Society Guidelines for the Early Detection of Cancer, 2006

### Screening Compliance

#### How can we improve compliance?

- Improve health access
  - Having health insurance
  - Having usual source of care & regular doctor
  - Offering the test during every encounter – electronic medical record tracking
- Improved patient education
- New biomarkers that are less embarrassing or uncomfortable
- Inexpensive screening biomonitoring tests

### Protein and Gene Biomarkers

- Gene variations associated with higher risk
  - Single genes – BRCA1 & BRCA2
  - Genomic fingerprints
  - DNA methylation – 50 genes where plays role in cancer
  - Abnormal genes in established cancers – presence of epidermal growth factor receptor mutations
- Protein markers
  - Single protein like PSA, CA 125
  - Protein profiling – OvaCheck for ovarian CA


# Disparities Reducing Advances Project

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## Protein and Gene Biomarkers

- Could look for proteins or genes in blood, stool, urine, saliva
  - For cancer often need to test tissue
- Need good clinical trials to determine if effective
- At present tests are very expensive \$1-3K
- Expect it will be some time before inexpensive screening tests are available

*Are there any promising candidates for 2015?*




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## Breath Test for Lung Cancer

Collected breath samples on 178 patients before bronchoscopy

- 67 primary lung cancers compared to 41 controls
- Sensitivity 89.6%, specificity 80.5%



**Will breath testing be the future screening procedure for lung cancer we are looking for?**



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## Breath Test for Cancer



### Canine Scent Detection of Cancer

- Lung Cancer
  - 55 Bx proven patients & 83 controls
  - Sensitivity 99%, specificity 99%
- Breast Cancer
  - 31 Bx proven patients & 83 controls
  - Sensitivity 88%, specificity 98%
- Bladder Cancer
  - 36 patients & 108 controls
  - Sensitivity 41%
- Patterns of biochemical markers



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## Saliva Test for Cancer

- Assess DNA, mRNA, proteins, bacteria patterns, etc.
- Current uses:
  - Alcohol, illegal drugs
  - Hormone levels, pregnancy
- Oral cancer, risk of cavities
- Patterns of mRNA or bacteria being evaluated for breast cancer
- Convenient for point of care





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# Biomonitoring for Prevention & Healthy Living

Biomonitoring Futures Project



**Craig Bettles**  
Institute for Alternative Futures



## Prospective Medicine

- Genetic & proteomic profile
- Lifestyle & psychosocial profile
- Analysis of exposures

**RESULTS**

INCREASED RISK:

Condition	Relative Risk	Lifetime Risk
Alzheimer's Dis.	3.4	40%
Heart Disease	2.7	60%




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# Disparities Reducing Advances Project

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## Genomic Biomarkers


- Identifying Gene Variations that Increase Risk
  - DeCode Genetics has identified a gene carried by 1/3 of Americans that might indicate added risk of type 2 diabetes.
- Gene Patterns (Genomic Fingerprints)
  - Kidney disease in Type 2 Diabetics
  - Proinflammatory genetic profiles contributing to cardiovascular disease
  - Increased risk for different types of cancer



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## Early Screening Detection



- Early & Pre-diabetes
  - Saliva Testing for mRNA patterns
  - Saliva Testing for Bacteria Populations
  - Breath Testing for Acetone
- Cancer & Pre-cancer
  - Saliva Testing for mRNA patterns
  - Breath Testing for VOCs
  - Fecal DNA for Colon Cancer
  - DNA Methylation
  - Detecting Intraepithelial Neoplasia (IEN)



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## Prospective Medicine





- Early detection of risk
- Early intervention
  - Tailored health action plan
  - Individualized Chemoprevention
  - Behavior modification

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## Biomonitoring for Healthy Living

- Although many diseases are caused by genetic makeup, about 40-50% of our disease burden is due to poor lifestyle choices – people not taking care of themselves.
- Yet only a fraction of the \$1.9 trillion U.S. health care expenditure is spent on helping people better manage their own health.

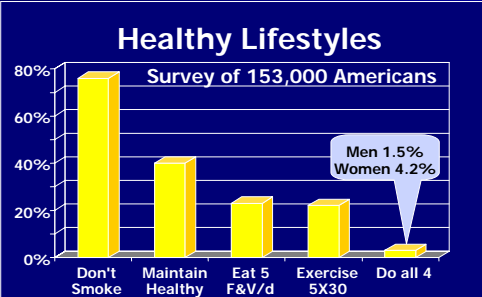





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## Biomonitoring for Healthy Living

### Healthy Lifestyles

Survey of 153,000 Americans



Reeves. Healthy Lifestyle Characteristics Among Adults in the United States, 2000. Arch Intern Med, 2005



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## Biomonitoring for Healthy Living

Five health-related behaviors were identified that are risk factors for many high disparity diseases:

1. Tobacco use
2. Poor nutrition
3. Lack of physical activity
4. Unsafe sex
5. Drug and alcohol abuse





HEALTH FOR ALL: California's Strategic Approach to Eliminating Racial and Ethnic Health Disparities (2003)



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# Disparities Reducing Advances Project

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## Biomonitoring for Healthy Living

Per  
ca

Create a Feedback Loop  
Where Pay More Attention  
to Their Health

- 
- Break

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## Behavior

### How can we change behavior?

- Education

IAF 68

## Behavior

### How can we change behavior?

- Education
- Coaching

IAF 69

## Yourselves! Fitness

IAF 70

## Behavior

### How can we change behavior?

- Education
- Coaching
- Incentives to stick with it
  - Frequent monitoring
  - Simulations
  - Rewards

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## Home Monitoring

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# Disparities Reducing Advances Project

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## Home Monitoring

### Smart Home

Please remember to take your medicine

IAF 73

## Healthy Living & Prevention

By 2015, Community health centers can check up on a patient's health remotely and automated systems warn both the health provider and the patient if their health deteriorates.

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## Promising Biomonitoring Advances

Promoting Biomonitoring as Disparity Reducing Advances:

Opportunities and Recommendations for the Field

From Biomonitoring Futures Project

IAF 75

## Promising Biomonitoring Advances

Key Opportunities for Biomonitoring to Reduce Disparities:

1. Support continuous, passive monitoring for healthy living & prevention
2. Develop an indwelling closed loop insulin pump and biomonitoring system
3. Focus on early detection for cancer through early screening using blood as a platform
4. Support the use of biomonitoring to change behavior, upstream, at the community and national level

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## Developing Biomonitoring to Reduce Disparities: Recommendations

1. HRSA and CMS should enhance partnerships for evaluating the intersection of biomonitoring platforms, specific disease biomarkers, and CHCs
2. Clinical Director's Network and other appropriate groups should help design & implement controlled studies of effectiveness of biomonitoring systems in CHCs as well as diffusing best practices
3. Encourage major federal agencies such as DoD, NIH and VA to develop a more coherent early stage funding programs based around biomonitoring for disparity reduction

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## Developing Biomonitoring to Reduce Disparities: Recommendations

4. Work with industry associations, such as PhARMA and NEMA on their members' biomonitoring activity and disparity reducing opportunities
5. The FDA should encourage testing and evaluation of biomonitoring devices among populations with less access and resources

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# Disparities Reducing Advances Project

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## Developing Biomonitoring to Reduce Disparities: Recommendations

6. Enhance the ability of CHCs and others to design, deploy and evaluate experiments/tests of potential biomonitoring advances
7. Provide forecasts or estimates of platforms under development or in consideration as well as potential disruptive innovations
8. Identify specific forums to develop and share information on biomonitoring for disparity reduction



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## Developing Biomonitoring to Reduce Disparities: Recommendations

9. Work with organizations to support the development of interoperability standards for biomonitoring devices
10. Review and encourage reimbursement strategies for effective biomonitoring, especially around prevention
11. Support a web based directory for biomonitoring technology, drug and device companies as well as early stage researchers and healthcare providers to network around biomonitoring for disparity reduction (e.g. Medical Automation.org)



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## The DRA Project 2006

- Pursuing Biomonitoring and other promising disparity reducing advances



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## Explore Promising Advances

- Committees to consider 7 promising advances
  1. Community Health/Prevention Approaches
  2. Using Cell Phones to Reduce Disparities
  3. Enhanced Consumer Support of Navigation of Health Care
  4. Continuous, Passive Biomonitoring for Health and Prevention
  5. Implanted, Closed-Loop Insulin Pump and Biomonitoring System
  6. Early Detection of Cancer Using Blood Testing
  7. Community and National Biomonitoring to Support Upstream Change



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## 1. Community Health/Prevention Approaches

- Reinforcing higher physical activity levels and safe, walkable communities
- Creating healthy eating programs in schools, vending machines and fast food restaurants.
- Fostering healthy eating by families – affordable, healthy food choices in grocery stores and shops
- Developing culturally appropriate healthy menus
- Implementing health education and literacy programs in schools and low income communities
- Building social capital and relevant norms
- Using community workers (e.g. barbers and hair dressers) as health coaches, lay health advocates and prayer buddies
- Implementing church based screening and prevention programs



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## 2. Using Cell Phones to Reduce Health Disparities

- Using the cell phone as a platform to distribute and access health information
- Using the cell phone for public outreach programs for screening, health promotion or disease management
- Providing incentives over the cell phone for behavior change linked to biomonitoring
- Providing nutritional information over the cell phone to help consumers make food choices that are both nutritious and culturally appropriate
- Using cell phones as a platform for serious games that improve health



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# Disparities Reducing Advances Project

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## 3. Enhanced Consumer Support of Navigation of Health Care

- A database of common definitions and terms
- Simple and clear documentation to point patients in the right direction
- Identifying and supporting ongoing sources of payment for consumer navigation
- Best practices on how to harness and enhance informal approaches to consumer navigation
- An electronic "Health Compass" for individuals for navigating health services



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## Other Promising Advances

4. Continuous, Passive Biomonitoring for Health and Prevention
5. Implanted, Closed-Loop Insulin Pump and Biomonitoring System
6. Early Detection of Cancer Using Blood Testing
7. Community and National Biomonitoring to Support Upstream Change



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## Criteria Committee

The DRA Project has developed a set of criteria for identifying the most important advances. These criteria will be explored and applied to the promising advances and the other specific advances in the areas listed above.



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## Draft Criteria for the "most important" DRA's

- Can make a very large, measurable difference in reducing health disparities
  - Across multiple diseases/conditions or within a single disease
    - ◆ Stimulates prevention by identifying pre-disease conditions or risks
    - ◆ Enables earlier detection of the disease
    - ◆ Enables better, higher cost/benefit ratio treatment
    - ◆ Lowers morbidity and mortality
  - Cost-effective enough to be applied and reapplied as necessary
    - ◆ For the health care provider
    - ◆ For the consumer/patient
    - ◆ For the insurer/third party payers
    - ◆ For society
- Appropriate for multiple poor and marginalized populations
  - Culturally, linguistically, age and gender appropriate
  - Large scale applicability across populations
- Encourages participation of individuals and key stakeholders
- Can be communicated to decision-makers and the public
- Can be realistically achieved within the next 10 years
- Can be effectively promoted or accelerated through the DRA Project Network



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## DRA in 2006

- Summer of 2006
  - Continue Scanning Activities
  - Conduct committees on 7 promising advances and applying the criteria
- Fall of 2006
  - Second Partners Meeting on Sept. 13<sup>th</sup>
  - Select and Report on Advances and Opportunities
  - Develop Forecasts for Advance Areas



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## DRA in 2007 & 2008

- Continue to Build the Partner Network
- Pursue and Develop Specific Projects Around Promising Advances & Opportunities
- Identify Design Changes in Advances Needed to Make Them Relevant to Underserved Communities
- Increase Deployment of Selected Advances Through the Partner Network
- Increase Deployment of Selected Advances By Targeting Decision Makers in Healthcare, Industry and Government



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**Disparities Reducing Advances Project**  
**April 6, 2006 Alexandria, Virginia**

### Joining the DRA Project

- The information presented here is available at
  - [www.altfutures.com/dra](http://www.altfutures.com/dra)
  - [www.altfutures.com/bfp](http://www.altfutures.com/bfp)
- If you and your organization are interested in becoming a DRA Project Partner – contact Clem Bezold or Sandra Tinkham at IAF ([stinkham@altfutures.com](mailto:stinkham@altfutures.com)).



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