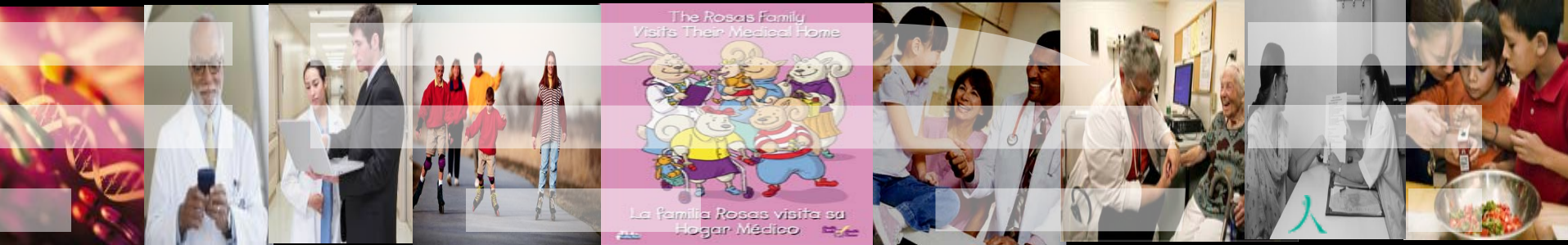


Smart Healthcare and Innovation

IBM the Employer, Workforce Health and the Healthcare Market

Almaden Institute 2010



*M-J. Sepúlveda, MD FACP
IBM Fellow & Vice President*

– **Why innovate**

- IBM healthcare experience
- smart people
- smart purchasing
- smart care

– **What innovations**

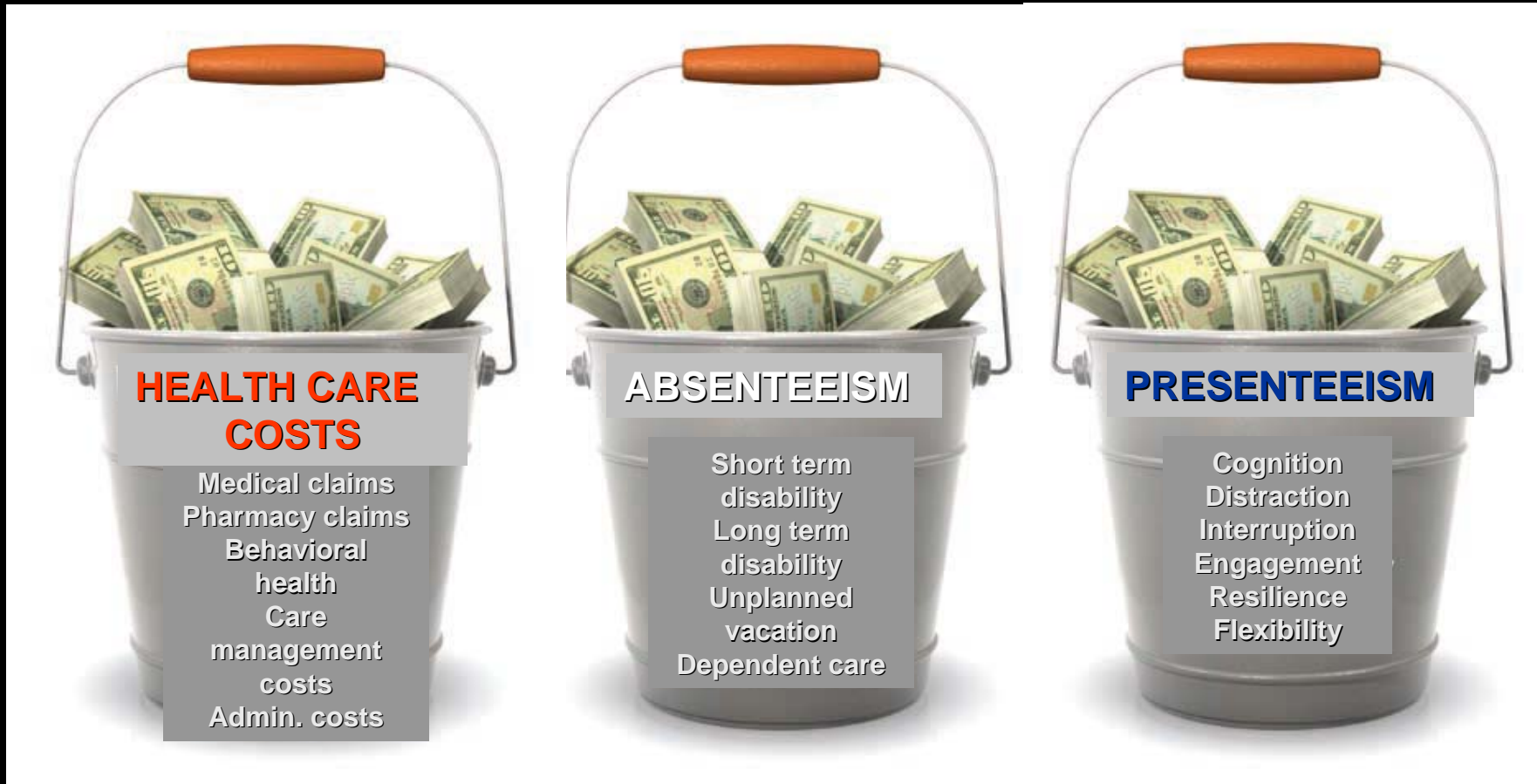
- total health management, virtual fitness
- childhood obesity
- personalized medicine
- hepatitis B virus
- delivery system and primacy of primary care

– **Where next**

- health Impact Pyramid: social determinants of health



Innovation Imperative

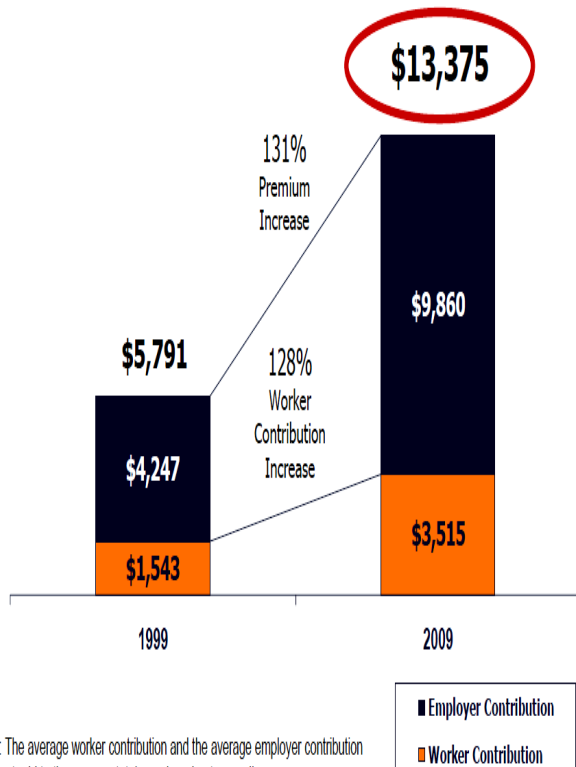


Why Innovate Affordability



Figure 1

Average Health Insurance Premiums and Worker Contributions for Family Coverage, 1999-2009

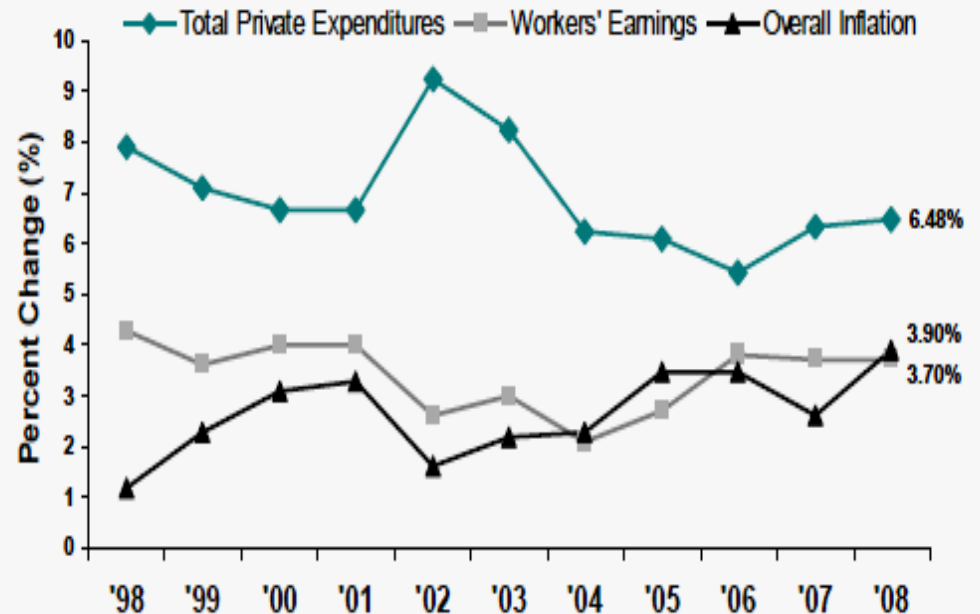


Note: The average worker contribution and the average employer contribution may not add to the average total premium due to rounding.

Source: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2009.



Annual Changes in Health Care Spend, Workers' Earnings and Overall Inflation (1998-2008)



Note: 2007 figure used for workers' earnings because 2008 figure is not available.

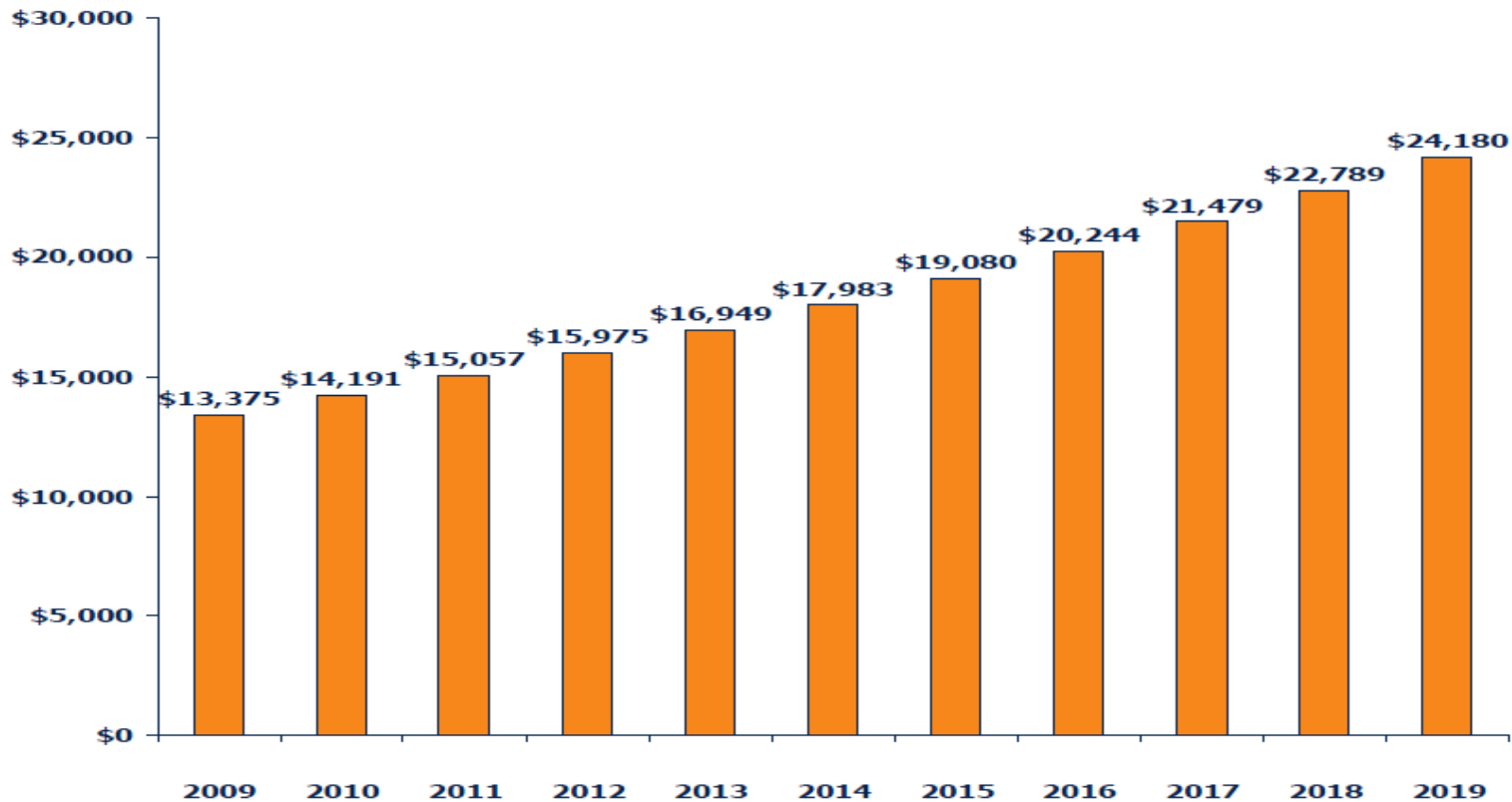
Source: 1988-2008 National Health Expenditure Data, with projections in 2008 (total private insurance, out-of-pocket payments and other private funds); Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2007; Bureau of Labor Statistics, Consumer Price Index, U.S. City Average of Annual Inflation (April to April), 1988-2008 (overall inflation); Bureau of Labor Statistics, Seasonally Adjusted Data from the Current Employment Statistics Survey, 1988-2007 (April to April).

Why Innovate Outlook



Figure 2

Illustrative Health Insurance Premium Projections for Family Coverage, Assuming Average Growth Rate of 6.1% from 2004-2009



Note: Health insurance premiums projected for 2010-2019 assuming that the average growth in premiums between 2004 and 2009 (6.1%) continues.

Source: Kaiser Family Foundation projections based on data from Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 2004-2009.



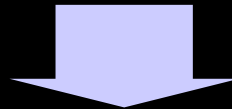
IBM Developed New Approach to Health Care



Vision: Healthy people for high performance

IBM Health Care Strategy ...

- * *Value* (quality and cost) * *Meaningful choice* * *Sustainable cost structures*
- * *Prevention* * *Primary Care* * *Smart decisions*
- * *Privacy & HIT*



- We investment in health care to realize the productivity and innovation of people
- Recognizes the importance of health care partnerships and accountability

Examples:

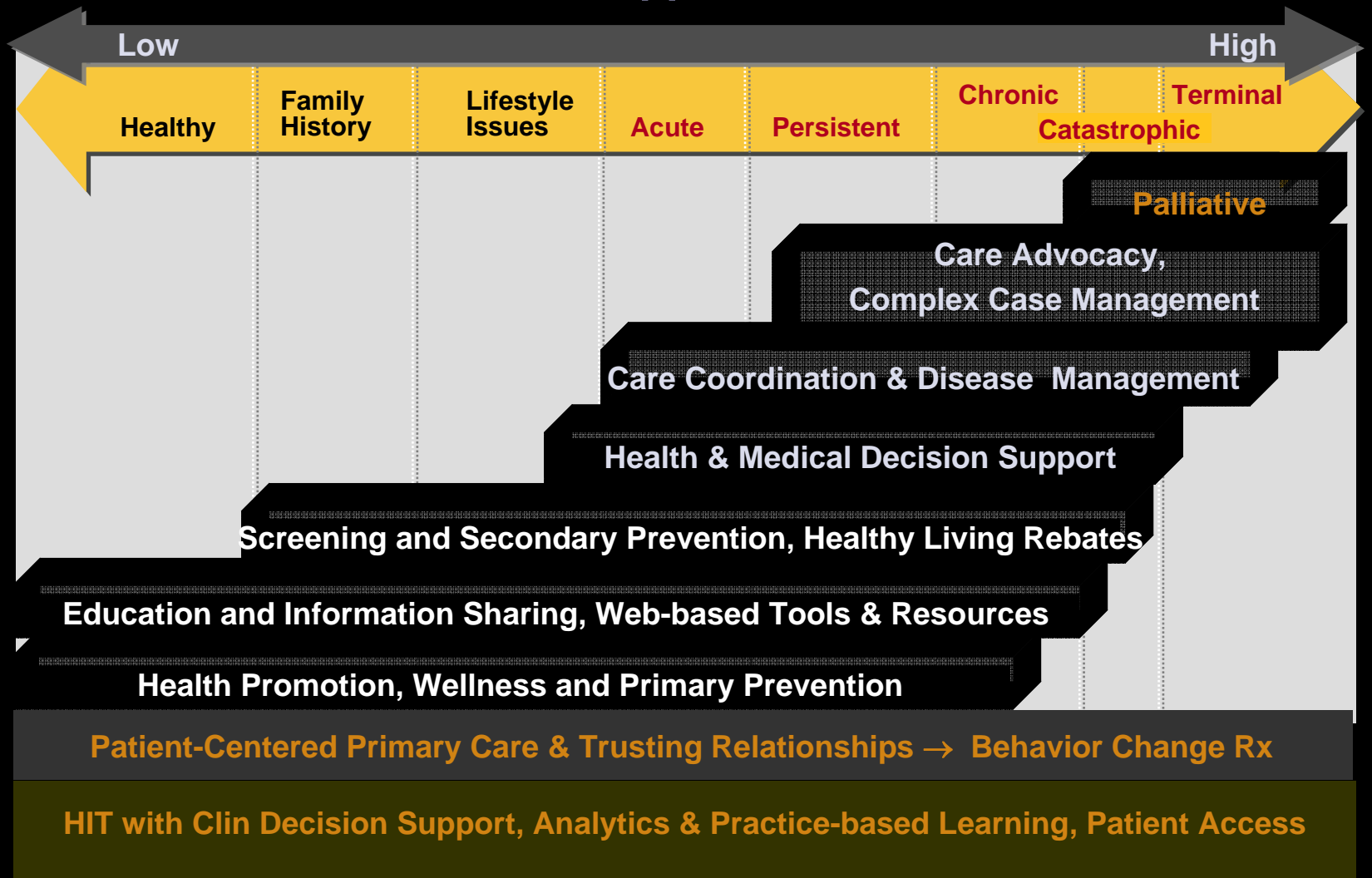
- Helping employees take responsibility for healthy behavior
- Employee involvement in treatment decisions
- Information that helps individuals choose health plans that offer optimal value and improve efficiency in the system.
- Technology-enabled, smart delivery of innovative health care services

Total Health Management & Patient-Centered Primary Care



Health Support

Health Status



Where It
All
Comes
Together

IBM's Virtual Fitness Center



VFC Offerings Since 1999

- Year-round support for an active lifestyle
- Participate on a team or alone
- Set activity goals
- Log physical activity
- Receive motivational email messages
- Interact with fitness professionals

The screenshot shows the IBM Virtual Fitness Center website. The header includes the site name, a navigation menu, and a calendar. The main content area is divided into three columns: a blue sidebar with links and a rebate notice, a green central article about osteoporosis, and a red sidebar with a 'Quick Logging' table.

Virtual Fitness Center
your link to year-round physical activity

Welcome: lcasella
Logout

Member Home | Activity Logging | Teams | Help | Ask Our Pros

Edit Profile | Adjust Goals

Bulletin Board

Physical Activity Rebate

[Your Rebate Scorecard](#)
[Important Rebate Information](#)

Quick Links

[Target Heart Rate](#)
[EWOL Health Resource Center](#)
[Fitness For Fall Mementos Preview](#)
[Ultra Challenge Articles](#)

[Return to Wellness for Life page](#)

For processing of the final rebates, all activity must be completed and logged by December 5, 2005. Be sure to log activity regularly, since you can only backlog activity up to five weeks prior to the current date.

Build muscle, build bones.

About 10 million Americans have low bone mass known as osteoporosis, and one in two women over 50 will have a related bone break, says the National Osteoporosis Foundation. Although nutrition plays a large role, weight-bearing activities, such as walking and resistance training, can help reduce the rapid loss of bone density.

Quick Logging

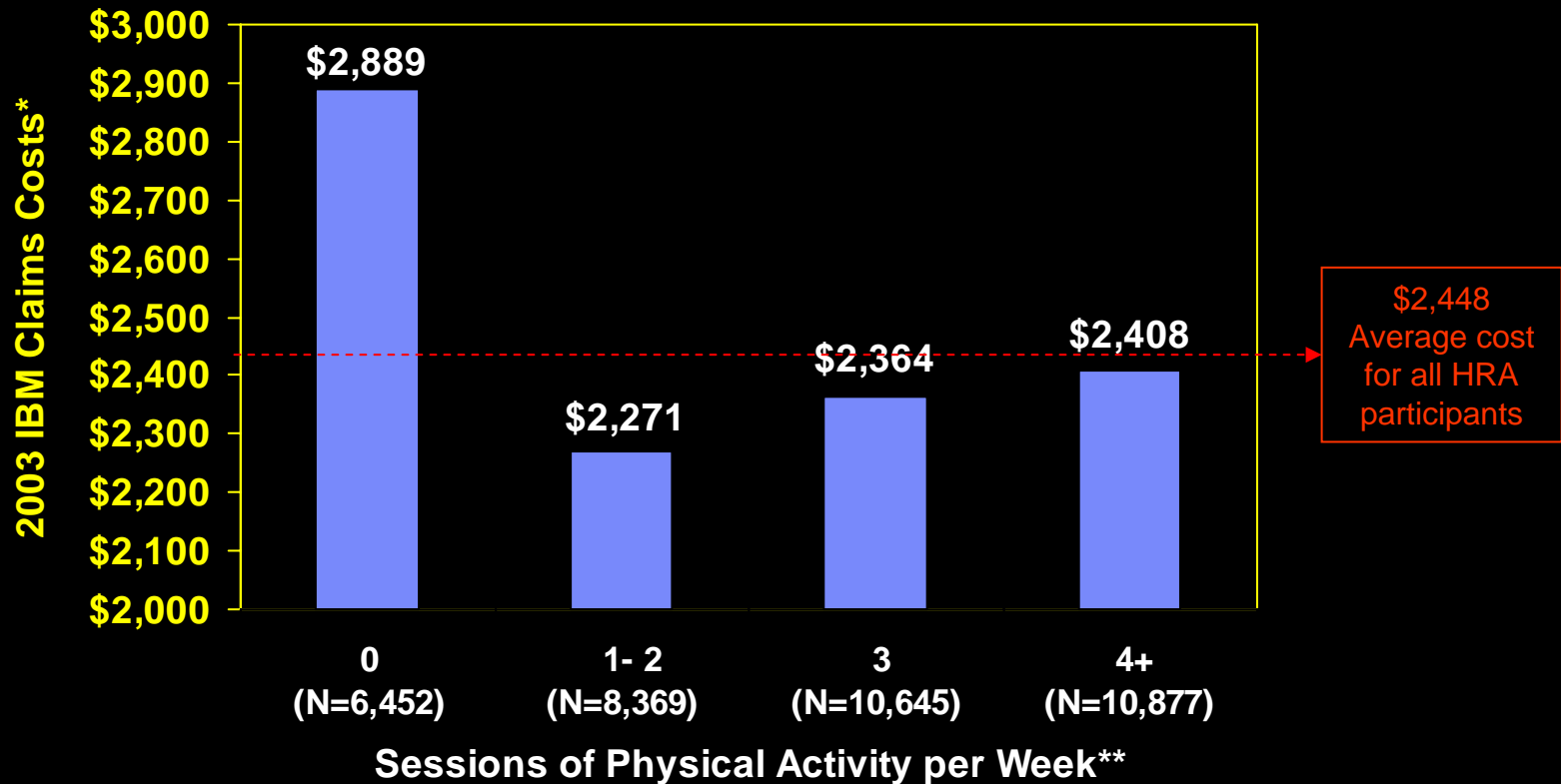
<<10/13 Friday October 14, 2005

Activity	Week Goal	Last week	This week	Today	Unit
Points					
Cardio Exercise	0	0	0	<input type="text"/>	Minutes
Cycling	6	0	0	<input type="text"/>	Minutes
Flexibility	5	0	0	<input type="text"/>	Minutes
Running	8	0	0	<input type="text"/>	Minutes
Strength Training	18	0	0	<input type="text"/>	Minutes
Walking	8	0	0	<input type="text"/>	Minutes

Save Minutes

Links: [Calendar Logging View](#)
[Adjust My Goals](#)
[Activity Graphs](#)

Lower Healthcare Claims Costs Seen With Moderate Levels of Physical Activity



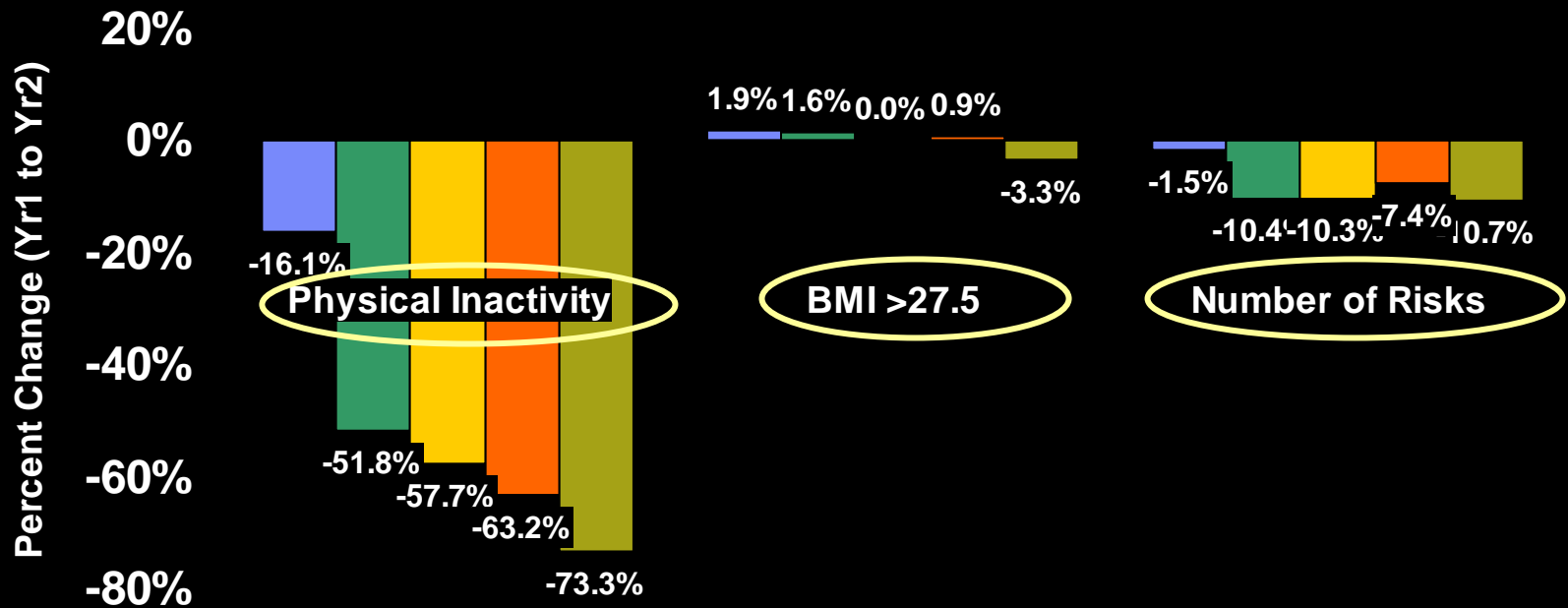
*2003 IBM paid medical and pharmacy claims costs.

**Self-reported physical activity on 2004 IBM HRA (No response=71) (Total N=36,414 of 54,072 HRA participants matched to claims costs).

As Physical Activity Increases Health Risk Decreases

Physical Activity Minutes Logged on the Virtual Fitness Center

■ 1-599
 ■ 600-1999
 ■ 2000-3999
 ■ 4000-5999
 ■ 6000+



Health Risk Area

Impact of Childhood Overweight (BMI \geq 85th percentile) on Adult Obesity (BMI \geq 30)

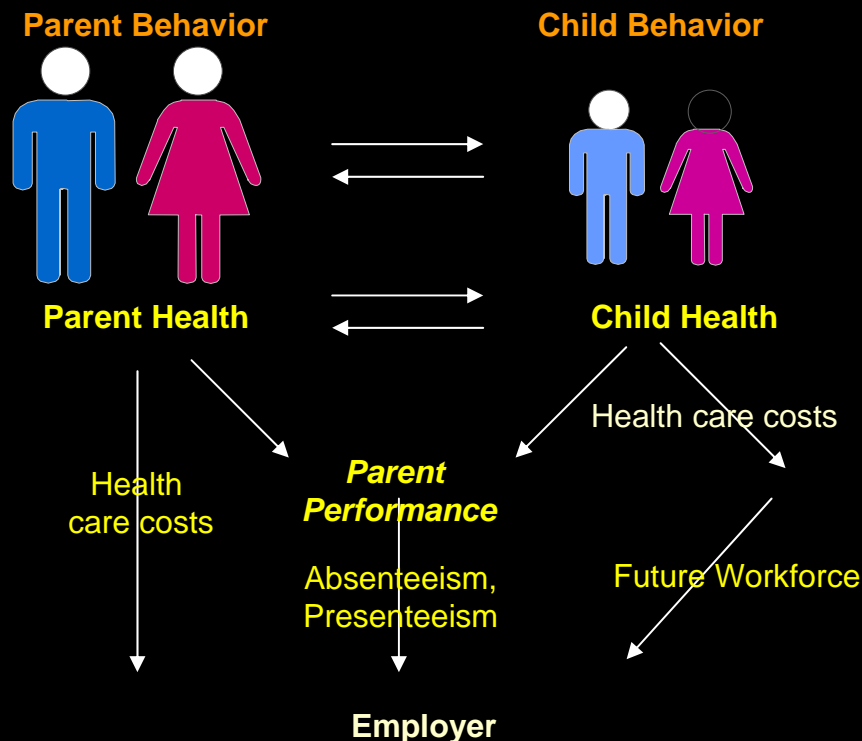
- 17% are obese and 15% are overweight
- 25% obese adults were overweight children
- 4.9 BMI unit difference in severity in adult if obesity carried over from childhood
- 50% of adults with BMI \geq 40 were obese as children
- Onset \leq 8y more severely obese as adults (BMI = 41.7 vs 34.0)
- Costs due to obesity U.S.

	<u>1998</u>	<u>2008</u>
<u>Total cost obesity U.S.</u>	78.5B	\$147B
<u>% U.S. Total medical costs</u>	6.5%	9.1%

Freedman et al, Pediatrics 2001; 108: 712

The Framework Of Parent-Child Interactions Potentially Affecting Employers

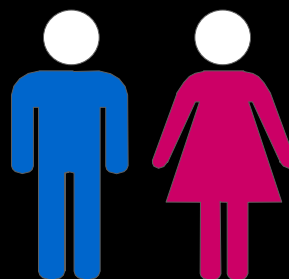
- Parents promote obesity in children
- Obese children beget 1 of 4 obese adults
- Both incur high costs in health care
- Caregiving for physical and psychosocial needs consume adult time and energy from work



The Direct Financial Impact on Employers

- Average claims costs for obese adults as well as obese children are nearly twice that of the non-obese
- Average claims cost of children with type II diabetes exceeds the average claims cost of adult type II diabetics

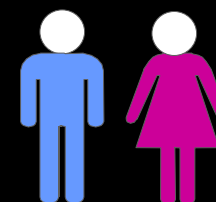
Adults



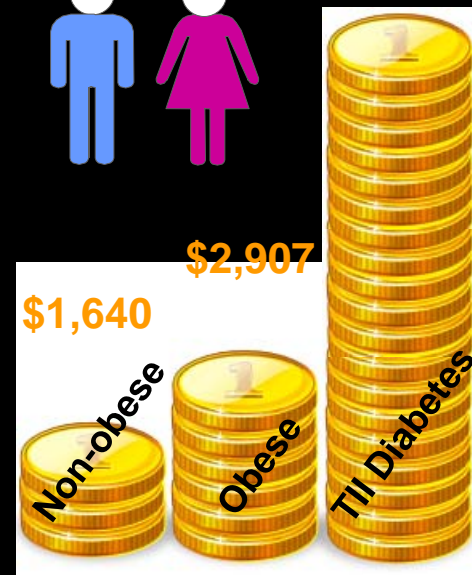
\$8,889 \$8,844



Children (18 and under)

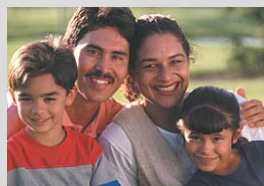


\$10,789





Children's Health Rebate



Children's Health

Rebate

Helping Parents & Families Aid Children in the Maintenance of Healthy Weight

[CHR Home](#) • [FAQ](#) • [Resources](#)

Set Family Action Goals

Setting actionable goals is one key to achieving success. We recommend setting these goals with your family, to be most meaningful.

Please choose **at least 3 goals total among the 4 focus areas below**, to target over the next 12 weeks. You can even type your own goal(s) in the text boxes provided.

Make Your Selections...

[Healthy Eating](#)
 [Physical Activity](#)
 [Screen Time](#)
 [Role Modeling](#)

Healthy Eating: (Click "Next" to proceed to the next focus area)

Fruits/Vegetables:

- Eat at least 5 servings of fruits and/or vegetables per child per day.
- Eat at least 3 servings of fruits and/or vegetables per child per day.



- 1- baseline inventory
- 2- set goals
- 3- track and report

Your Family Action Goals

The personalized family action plan below is provided for use by you and your family. It can be printed using the link below:

[Print](#)

Focus Areas	Family Action Goals	Goal Tracking (mark each week you meet the goal)											
		WK 1	2	3	4	5	6	7	8	9	10	11	12
Healthy Eating	Buy fresh fruits and vegetables each week.												
	Plan healthy meals in advance for the upcoming week.												
Physical Activity	Walk children to school, church, library, or other destination you would normally drive to at least once per week.												
	Make active indoor and outdoor chores the children's or whole family's responsibility (eg, vacuuming, mowing) each week.												
Screen Time	Create alternatives to entertainment screen time during free time.												
	Limit TV time to 1 hour per child per day.												
Role Modeling	Participate with your children at sports practices each week.												
	Manage family free time without excess screen time (sharing responsibility of this with children).												

What we've learned so far

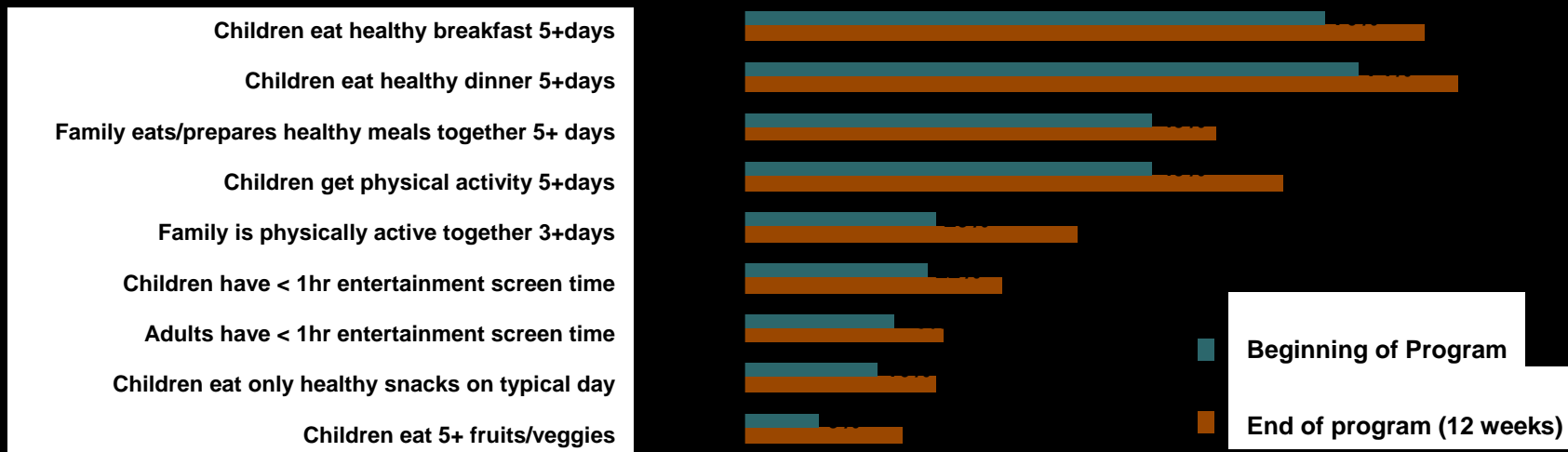
- Families engage, 11.7K earn rebate in 2008 – many add own goals...**

“Kids write what fruits and veggies they want” “No parents’ TV or computer between 6 & 9 PM”

“Start with smaller portions and have kids ask for seconds”

“Both parents in the pool during children’s swim lessons” “Adults watch portion sizes on desserts”

- Families change behavior, some change is harder than others**

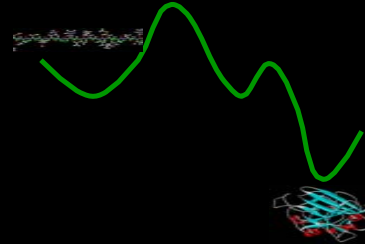


Percent of Participants (N=11,743)

- Families value program, IBM**

Personalized Medicine

Use of genetic and non-genetic molecular information to individualize prevention, diagnosis, treatment and prognosis for each person with greater precision.



The paradigm of personalized medicine, PMC
personalizedmedicinecoalition.org

THE DNA AGE

Fear of Insurance Trouble Leads Many to Shun or Hide DNA Tests



Brendan Smialowski for The New York Times

Katherine Anderson, seen in a checkup last week, developed a blood clot last year partly due to an undiagnosed genetic condition.

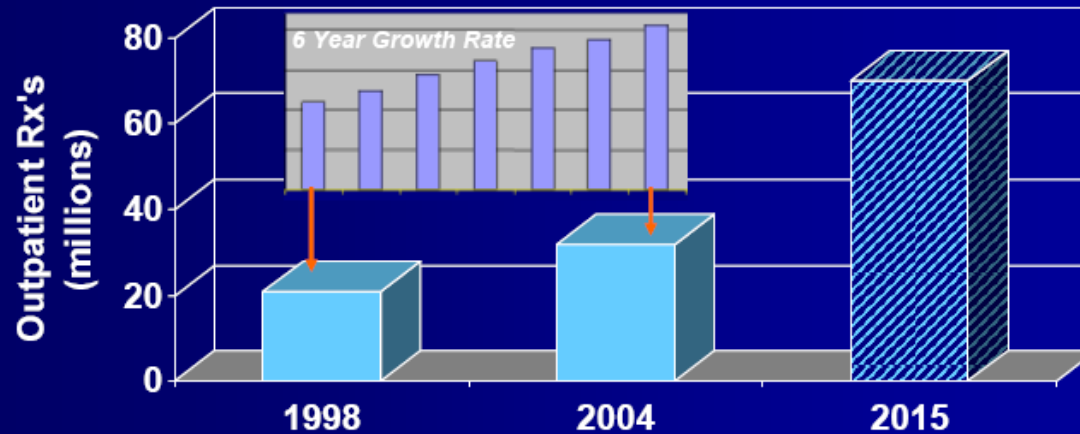
By AMY HARMON

Published: February 24, 2008

Warfarin



Real and Projected Growth in Anticoagulant Market: 600,000 New Patients Per Year

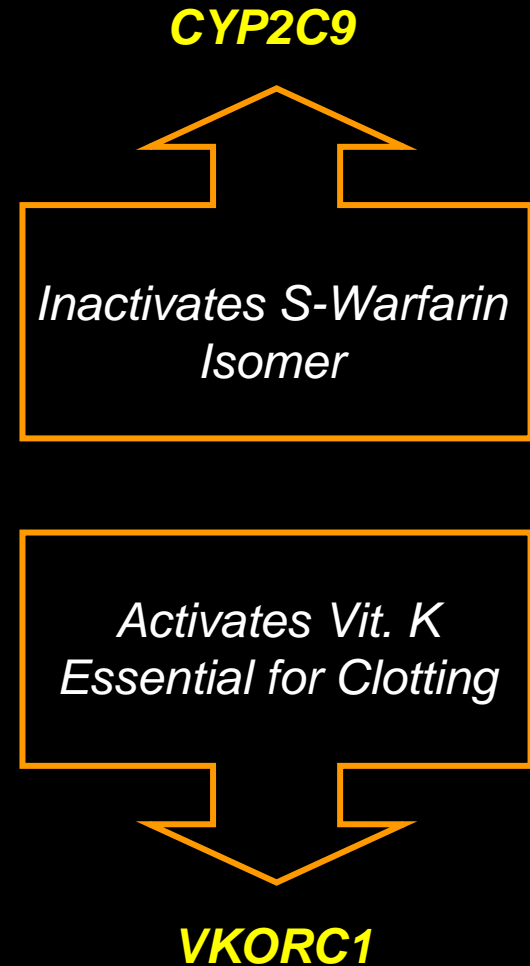


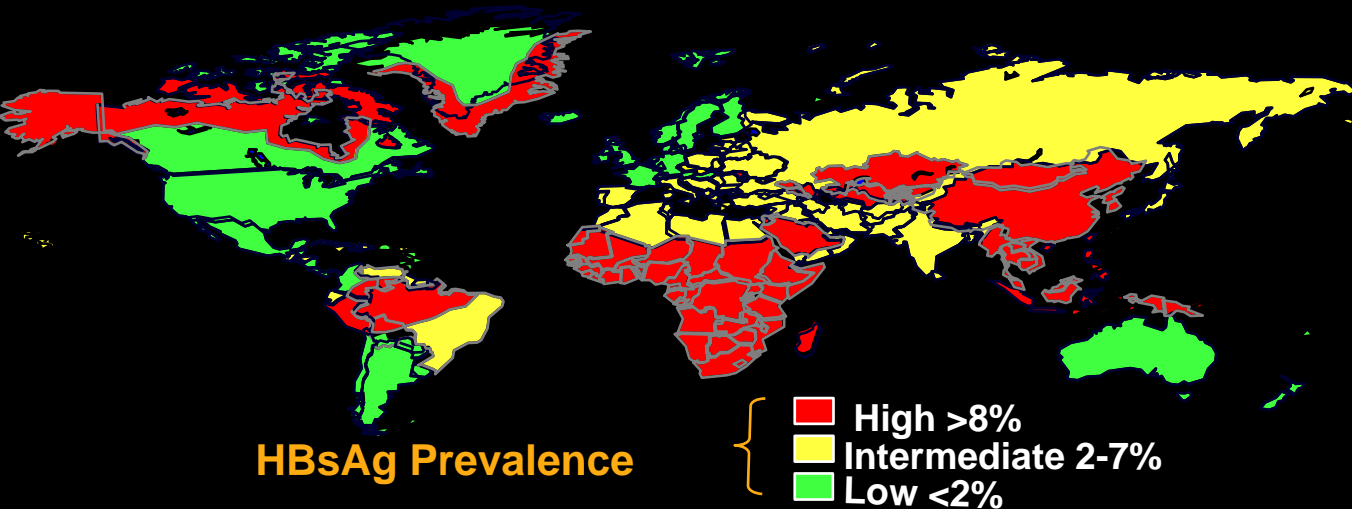
*Note: Anticoagulant market projected to increase 3 to 4-fold between 2004 and 2015
Sources include National Rx Audit, IMS Health Forecast (MIDAS)*

- >600,000 new patients starts/yr. (/2M total); >31M scripts/yr to >60M proj. by 2015
- **Narrow therapeutic window, wide inter-individual variability**, dosing empiric, INR ratio without significant impact on reduction major bleeding
- **#1 cause of adverse drug event related death & hospitalizations, #2 ER visits US**
- Major hemorrhage: 3-16%; minor hemorrhage 25-27%
- Robust evidence base for genetic polymorphisms impact on pharmacodynamics

Warfarin Gene Guided Rx

- Free Allelic Testing VKORC1, CYP2C9
- New to Warfarin Users Only
- PBM & Lab Project
- Patient & Physician Decide
- Strong Privacy Protections
- Fall 2007-March 2008
 - >3700 eligible
 - 786 Patient-MD Accepts
 - 430 Results Completed
 - Normal Response 28%
 - Diminished Response 28%
 - Heightened Response 44%





- Infected worldwide : 2 Billion
- **Chronically infected:**
 - Worldwide : 350-400 Million (v. 33M HIV)
 - Worldwide: 1 in 10 Asians (10% Asian Americans)
 - 2 of 3 not aware
- **Transmission mother to child: 40-50% of the cases in Asia**
- **HBV mortality:**
 - Deaths per year: 500K to 1.2M
 - Liver cancer deaths per year: 300-400K of all HBV deaths
 - China: HBV deaths = deaths from TB/HIV AIDS/Malaria combined
- Vaccine available for over 25 years; first “Anti-Cancer” vaccine



Hepatitis B Infection A Workplace Issue China



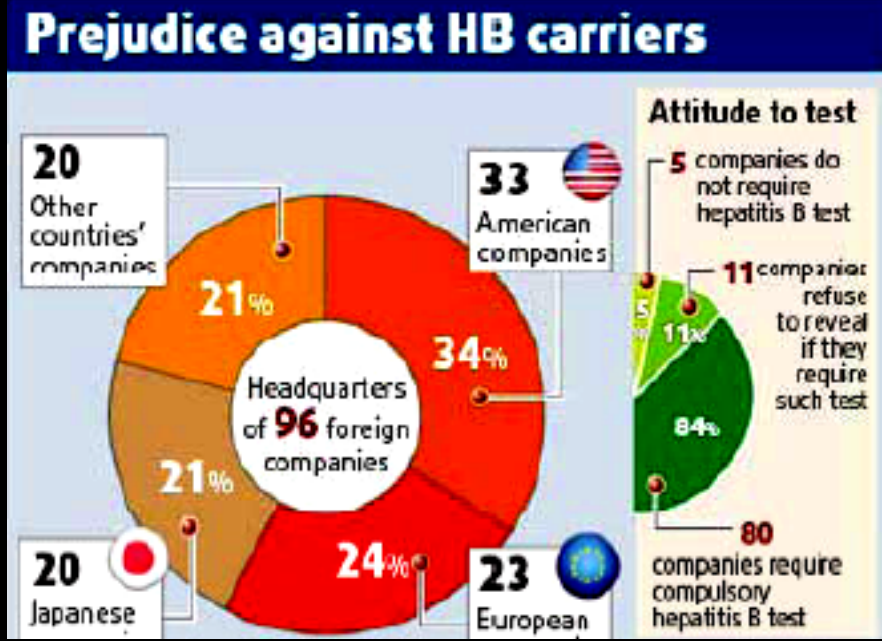
2008 CFHPC Survey 96 Global Corporations

- 2007 CFHPCV Internet Survey 10,352 HBV
 - 69% M.I. employment discrimination HBV/HIV
- 2007 Survey 10 Cities China, 3,500 surveyed
 - 49% unwilling to have chronic HBV co-worker
 - 55% would not hire them

Xinhua Economic News, 2007-06-28

- 2008 CFHPC 96 Global Corporations in China
 - 34% US, 24% European, 21% Japanese
 - Only 5 companies did **NOT** test for HBV

www.cfhpc.org



**84 % HBV Testing
44% Reject HBV+**



Understanding brings hope, Education helps life!

▪ IBM late 1990's

- Late 1990's eliminated HBV in hiring process China, Asia
- Instituted education and training
- Created HBV vaccination program
- Health exams:
 - voluntary: serologic testing, liver function
 - ultrasound as indicated
 - Beijing IBM pop'n 2005 to 2009 **69% anti-HBsAb-/anti-HBc-** to **15.6%**

▪ **乙肝病毒感染者同样能够长期健康地工作**
Hep B virus carriers can work happily in a company

访IBM全球健康服务部中国区陈彤博士

Interview with IBM Physician Dr Tong Chen of IBM China

Hepatitis and Liver Cancer

A National Strategy for Prevention and Control of
Hepatitis B and C



INSTITUTE OF MEDICINE

OF THE NATIONAL ACADEMIES

Advising the nation/Improving health

Lack of awareness and associated deaths U.S.

Virus	Prevalence Chronic Infection	% of Population Unaware of Infection Status	Deaths in 2006 Related to Infection
HBV	800,000 –1.4 million	About 65%	3,000
HCV	2.7–3.9 million	About 75%	12,000
HIV	1.1 million	About 21%	14,016

} 15,000

- Over 150,000 deaths due to hepatitis B and hepatitis C
- are projected to occur in next 10 years

Lack of Public Resource Allocation



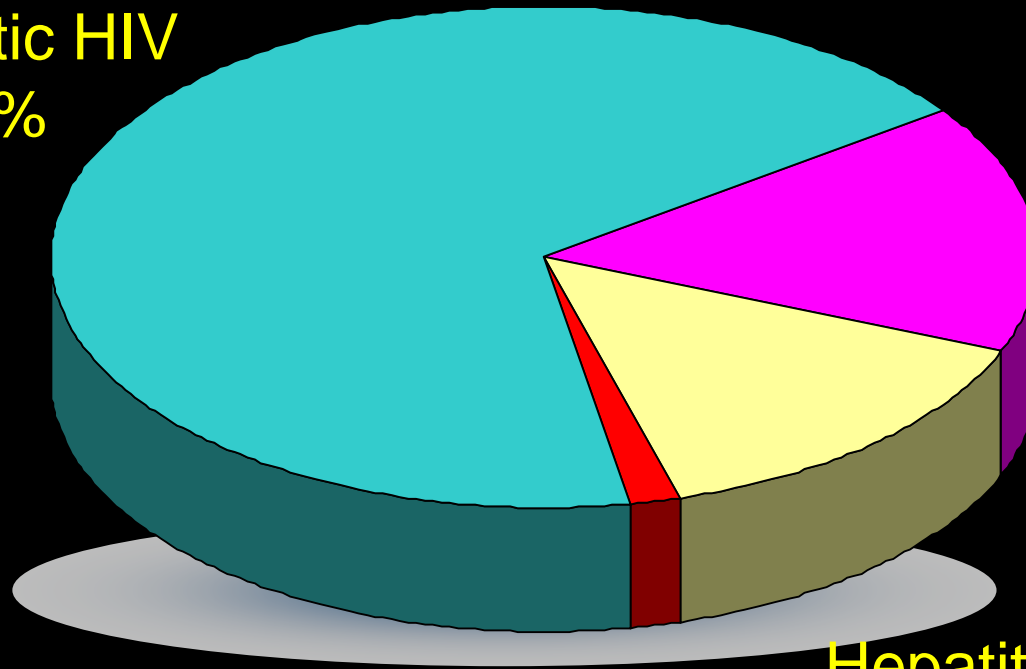
National Center for HIV/AIDS, Viral Hepatitis, Sexually Transmitted Disease, and Tuberculosis Prevention Funding

\$1 Billion Total

**Domestic HIV
69%**

STD 15%

Hepatitis 2%



Source: CDC

The Consequences



- Morbidity and Mortality related to hepatitis B and hepatitis C

Lack of Public Awareness

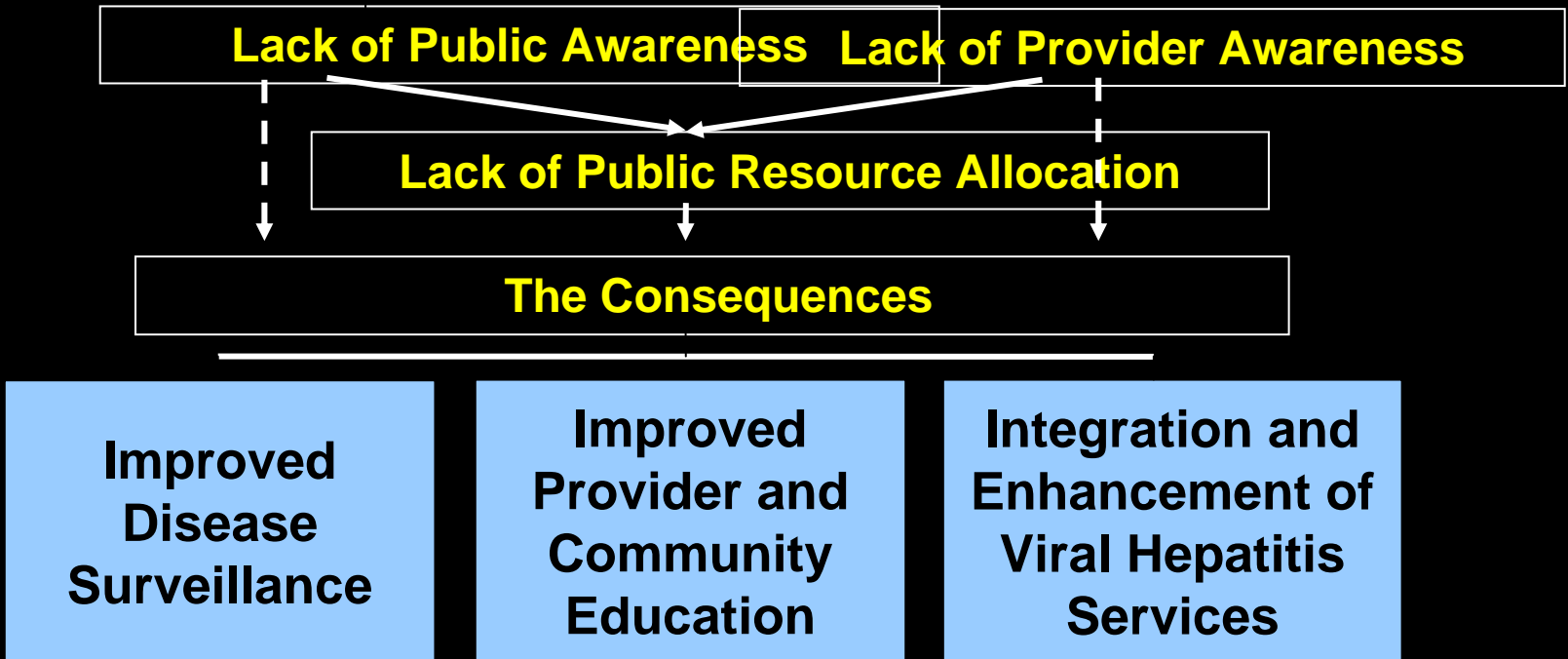
Lack of Public Resource Allocation

- At-risk people do not know how to prevent becoming infected
- At-risk people may not have access to preventive services
- Chronically infected people do not know that they are infected
- Providers do not screen people
- Providers do not know how to manage infected patients
- Inadequate access to testing and medical management
- Inadequate disease-surveillance systems

The Recommendations



- Morbidity and Mortality related to hepatitis B and hepatitis C



President Obama and IBM CEO Conversation



*There is little benefit in merely converting individual doctor's offices from paper to computer... more important is the effect that IT investment will have on the **care provided to individual patients**.*

*With electronic records, **primary care** doctors will have the knowledge that they need about each patient to make treatment most effective and **to coordinate care** with specialists, hospitals and the patients themselves.*

By focusing on primary care, we can move U.S. health care toward a system that promotes wellness and prevention.

- January 29, 2009



Power of Physician-Employer Partnership



- **2006**
 - October Employer-ACP/AAFP Meeting D.C.
 - Nov 2006 Medicare Auth Act MH demo projects
- **2007**
 - February Joint Principles PCMH
 - February First PCPCC Summit D.C.
 - Pilots launched
 - Principles endorsement: 19 medical societies, NMSA, AAMC, AMSA
 - May 350 of Fortune 500 Educated
- **2008**
 - 307 organization members
 - 4 Centers for Collaboration & Action
 - June: 108 bills 26 legislatures MH; 20 bills MH demos
- **2010**
 - >600 organization members

PCPCC 2010 >600 Organization Members



- Center to Promote Public Payer Implementation
- Center for Multi-Stakeholder Demonstration
- Center for Health Benefit Redesign and Implementation
- Center for eHealth Information Adoption and Exchange

The Patient-Centered Primary Care Collaborative is comprised of broad stakeholder support and participation.



Suppliers

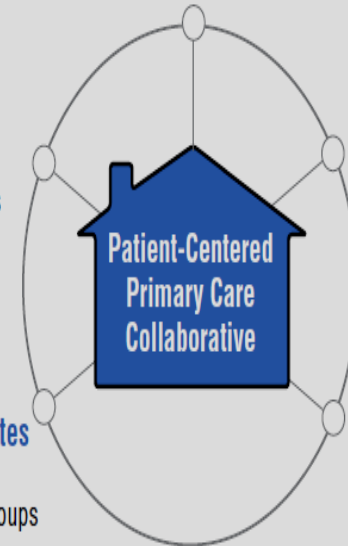
- Pharmaceutical and medical device companies
- Solution providers

Consumer advocates

- Unions
- Special interest groups

Providers

- Primary care associations (333,000 physicians)
- Associations representing integrated delivery networks, academic medical centers, community hospitals (4,000)



Purchasers

- Most Fortune 500 companies
- Many small and medium businesses via local business coalitions
- National Business Coalition on Health
- National Business Group on Health
- The ERISA Industry Committee
- HR Policy Association

Health plans

- Health plans including Aetna, BlueCross BlueShield Association, The Capital District Physicians' Health Plan, CIGNA, Healthcare Services Corporation, Humana, Medco, Priority Health, Taconic IPA, UnitedHealthcare, WellPoint

Source: Patient-Centered Primary Care Collaborative.

IBM & UHC Medical Home Pilot Arizona 2008-2011



Expanded Patient-Centric Clinical Services and Capabilities

Enhanced Access

- Timely Appointment Scheduling
- Evening, Weekend and Holiday Hours
- After-Hours Support



Care Coordination and Chronic Condition Management

- Weekly identification of patients in transition or at risk
- Specialty Referral Coordination and Tracking
- Disease and Case Management Enrollment



Team Care

- Physician-directed team both in and outside of the practice setting
- Management of Care Transitions across the Health Care Continuum

Performance Measurement, Assessment & Improvement

- Practice in accordance with clinical evidence
- Performance Evaluation Based on Medical Best Practices
- Measurement of Clinical Processes and Outcomes



Clinical Information Systems

- Care Management
- Decision Support
- Electronic Prescription Filling

Enabling Technology & Practice Support

Technology & Tools



- Personal Health Record
- Point of Care Information
- Electronic Prescriptions
- In-depth reporting

Care Coordination Management & Support



- Health plan care & disease management
- Educational Materials
- Patient Activation Tools

Transformation Support



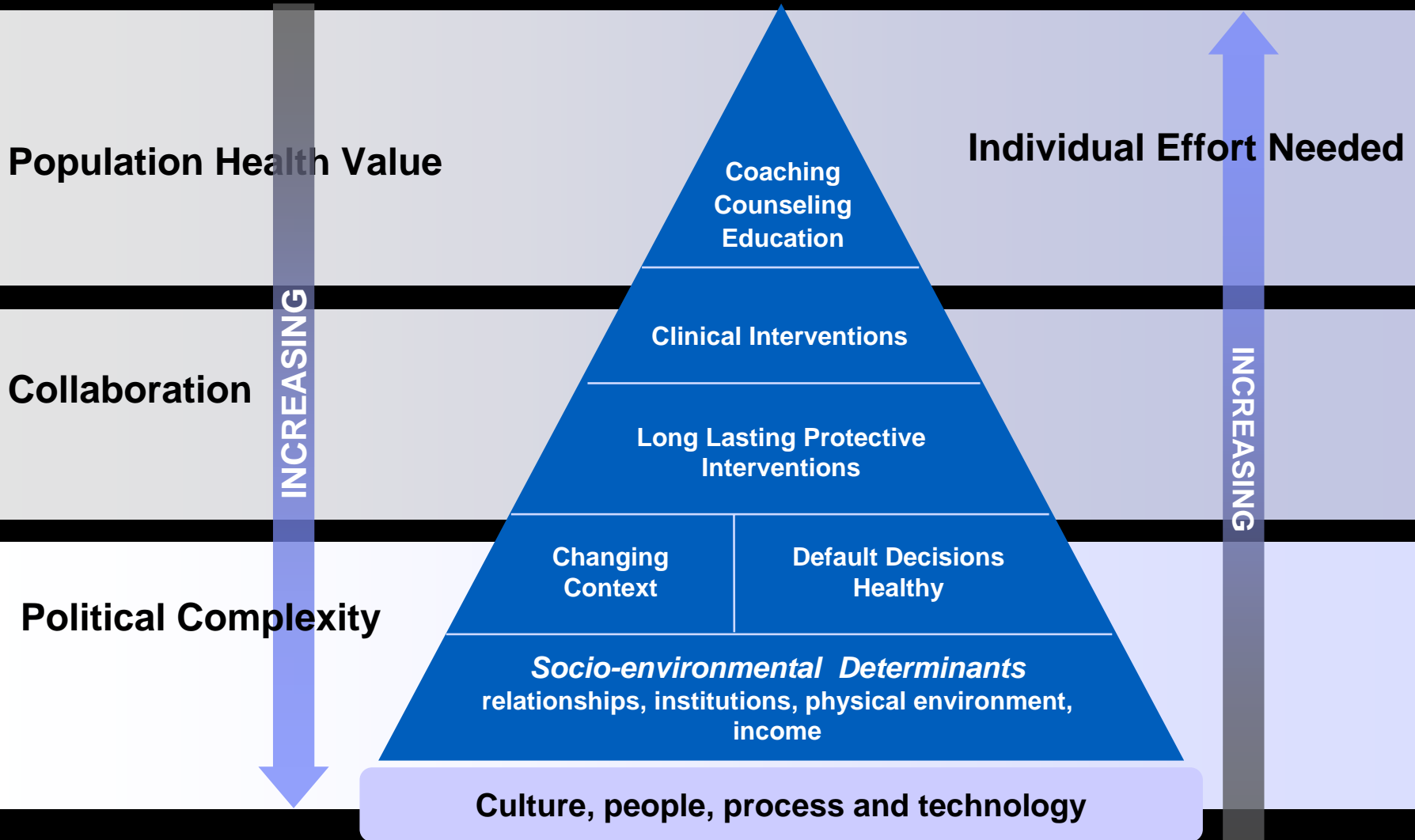
- Assigned facilitator
- Online tools
- "Boots on the ground" resources

Benefits

- More time for Patients
- Better Care Continuity
- Improved Care Transitions
- Improved Quality of Reporting
- More efficient care delivery
- Enhanced Patient Focus
- Improved Patient Safety
- Improved Practice Profitability and Satisfaction
- Simplified and Coordinated Health Care Experience

PRACTICE QUALIFICATIONS (Based on NCQA PCC-PCMH Standards)

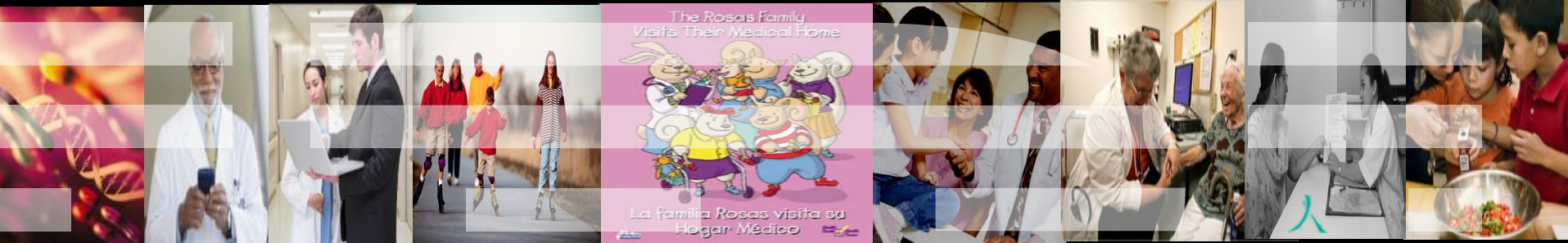
“Health Impact Pyramid”



Smart Healthcare and Innovation

IBM the Employer, Workforce Health and the Healthcare Market

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*M-J. Sepúlveda, MD FACP
IBM Fellow & Vice President*