



# What We Have Learned the Last 50 Years – And Aren't Using

Presented by: Chris Stehno  
November 16, 2006

# The US Surgeon General

---

70% of the diseases and subsequent deaths in the U.S. are lifestyle-based

# The CDC

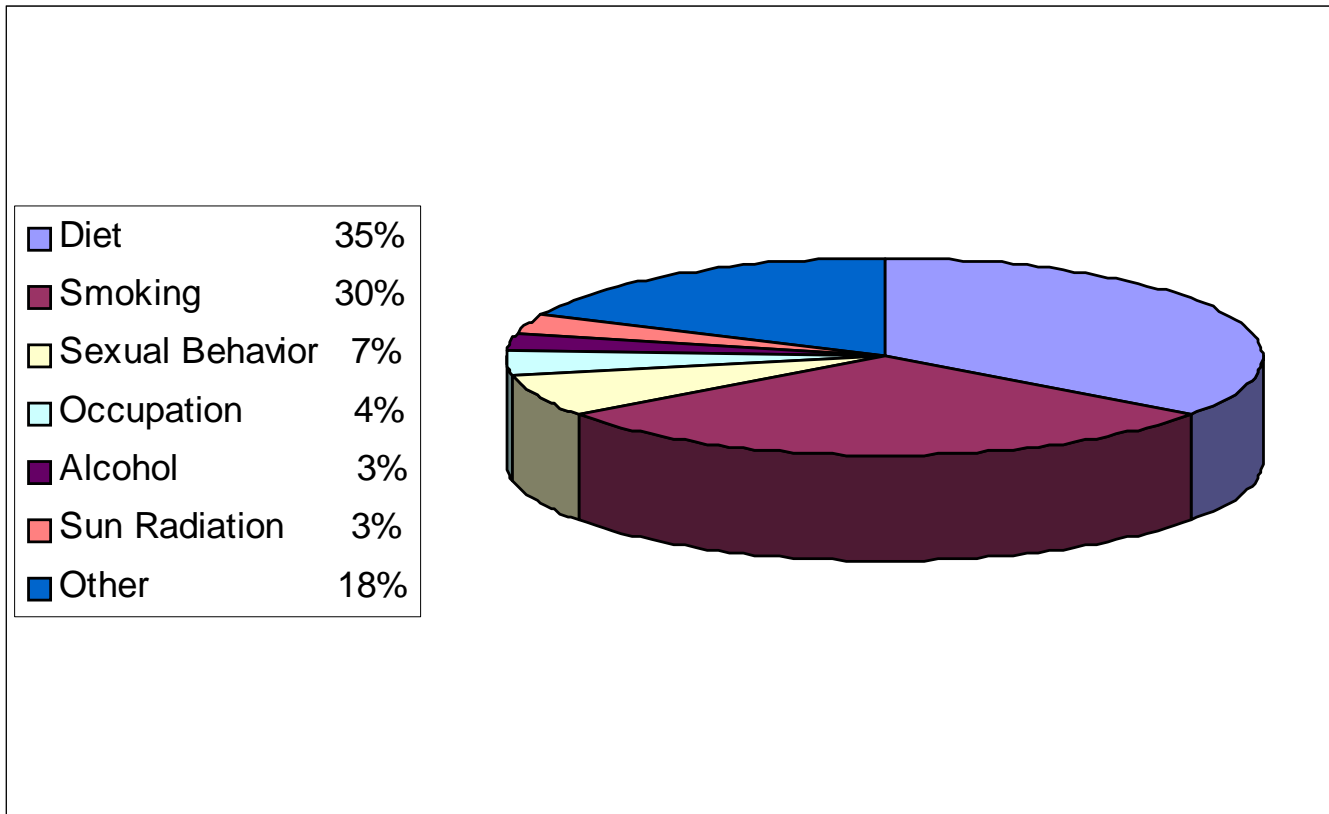
---

Lifestyle-based chronic diseases account for 75% of the nation's \$1.4 trillion medical care costs

# American Cancer Society

---

## Correlation between Lifestyle and Cancer



## 2004 INTERHEART Study

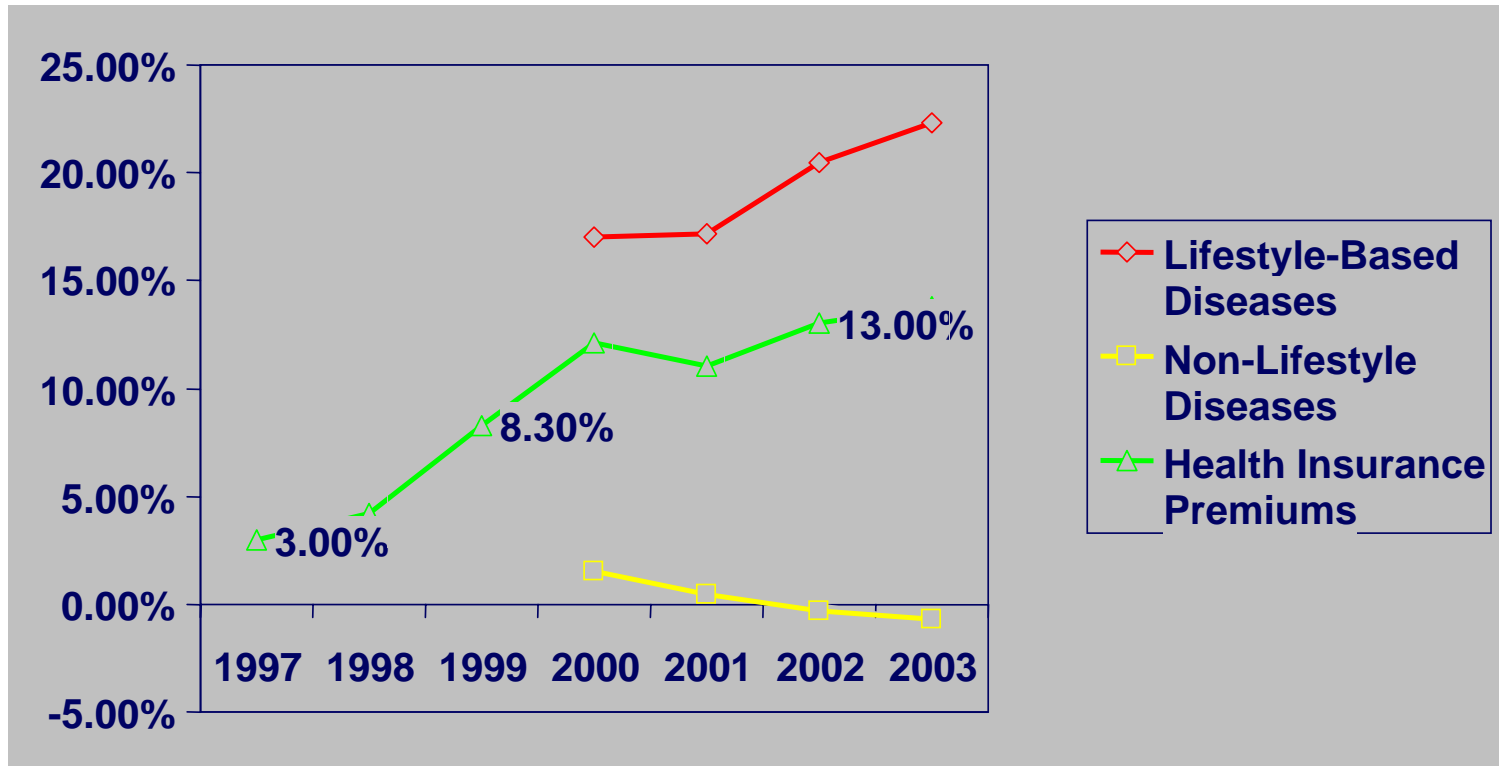
---

Over 90% of the risk of a heart attack (myocardial infraction) is attributed to lifestyle factors

- Factors include: abnormal lipids, smoking, hypertension, abdominal obesity, consumption of fruits and vegetables, alcohol and regular physical activity
- Family history: thought by many to be the major risk, only accounts for 1% of the population attributable risk

# Growth in Lifestyle-Based Diseases

---



Kaiser Foundation / MedAlytics

## Little Change in 50 Years

---

- The way we measure or assess health risks has not changed much in 50 years
- Even though most lifestyle-based diseases today are poorly correlated to individual and/or family medical histories, we still use medical history as our number one risk assessment tool
- In a typical medical predictive modeling setting we are only evaluating about 30% of the population

# Definition of Lifestyle Diseases

---

Lifestyle diseases (also called diseases of civilization) are diseases that appear to increase in frequency as countries become more industrialized and people live longer.

(WHO)

Lifestyle disease is a disease associated with the way a person or group of people lives. Lifestyle diseases include atherosclerosis, heart disease, and stroke; obesity and type 2 diabetes; diseases associated with smoking, alcohol, and drug abuse. Regular physical activity helps prevent obesity, heart disease, hypertension, diabetes, colon cancer, and premature mortality.

(Stedman's Medical Dictionary)



# Lifestyle-Based Diseases

---

## Lifestyle-Based Diseases/Conditions

- Diabetes
- Hypertension
- Cardiovascular
- Stroke
- COPD
- Maternity
- Most cancers
- Back pain
- Some mental health: Depression, Alzheimer's, etc.
- Others: Osteoporosis, Arthritis, etc.

# Lifestyle-Based Analytics

---

Lifestyle-Based Analytics (LBA) switches the method of detection focus from poorly correlated medical events to highly correlated lifestyle behaviors

Similar predictive modeling techniques to traditional medical modeling

# LBA Example

---

<b>Diabetes Profiling Example</b>			
<b>Data Element</b>	<b>Employee A</b>	<b>Employee B</b>	<b>Diabetes Ratio A to B</b>
Age	40	40	1 to 1
Vehicle Type	MiniVan	MiniVan	1 to 1
# of Children	3	0	1 to 10
Outdoor Rec	4 plus	No	1 to 25
Fast Food	Rarely	Frequent	1 to 40
Lifestyle Ind	M17	RE3	1 to 60
Hobbies	Active Outdoor	Reading	1 to 80
....	....	....	....
....	....	....	....
Online Purchasing	Sporting Goods	Clothes	1 to 110

# Maternity Example

---

Traditional maternity factors are based on age/sex/geographic/family enrollment

- A simple Empirical model using number and ages of children can increase accuracy by over two-fold
- Additional lifestyle elements can dramatically improve accuracy by including financial indicators, household living parameters, square footage of house, number of bedrooms, type and size of vehicle, etc.

# Maternity Model

---

## Sample Birth Rates

- 35 yr female – 6.9%
  - With 0 Children – 6.0%
  - With 1 Child – 9.1%
    - With a newborn – 4.3%
    - With a 2 yr old – 15.4%
  - With 2 Children – 6.5%
    - Ages 10 & 8 – 2.8%
    - Ages 4 & 2 – 9.1%
      - Boy & girl – 5.8%
      - Two girls – 12.5%
  - Range considering age & sex of children and spouse is from 1% to 29%

---

# Lifestyle Data Sources

# Currently in Place

---

## Applications and enrollment forms

- Individuals and groups
  - Family information
  - Age, sex and age differences in family members
  - Employment
  - Job description
  - Height / weight
  - Commute time
  - Geography

# HRA's and Other Surveys

---

Excellent source for lifestyle-based data

Several key problems

- Expensive to administer (>\$10/ member)
- Additional cost tied to participation incentives
- Poor participation rates
- Questionable results on the unhealthiest population
- Timing issues for new business/members



# Consumer Data

---

The plethora of consumer data has dramatically changed our way of interacting with consumers

Consumer data measured in Disk Storage per Person (DSPA)

- 1985 – 0.02 Mbytes/yr
- 1995 – 26 Mbytes/yr
- 2005 – 3,500 Mbytes/yr

## Consumer Data – Why?

---

- Primarily used for marketing, customer service and fraud purposes
- Graham-Leach-Bliley Act of 1999
  - Requires opt-out
  - “Permitted by law”
  - Joint marketing agreements

# Consumer Data – Where?

---

Government – Public Records

Census

Financial Services

Surveys

Warranties

Loyalty Programs

Internet Purchases

Subscriptions

## Consumer Data – Who?

---

- 95% of U.S. Households
- Historically: household-based
- Newest trend: individual-based
  - Observed
  - Implied

# Consumer Data – What?

---

## Traditional Demographics

- Age, sex, race, etc.

## Financial

- Homeowner, credit score, mortgage/auto/credit card balances, etc.

## Household

- Marriage status, number and ages of children, etc.

# Consumer Data – What?

---

- Lifestyle-Based Elements

- Physical activeness

- Running, walking, cycling, aerobics, golf, tennis, etc.

- Physical inactiveness

- Television time, computer time, board games, stamp and coin collecting, etc.

- Food purchases

- Fast food, diet food, gourmet, vegetarian, etc.
- Wine and other alcohol

- Self improvement

- Health/fitness, dieting/weight loss, etc.
- Mental wellness, personal improvement, etc.

# Consumer Data – What?

---

- Lifestyle-Based Elements
  - Tobacco
  - Occupation
  - Travel
  - Motor vehicle type
  - Recreational vehicles
  - Other

# Data Regulations

---

- Data is not covered under HIPAA
  - The data we use does not contain medical information
  - Future possibilities for self-report medical data will need to be evaluated
- Fair Credit Reporting Act
  - Applies to “individuals”
  - Alternative FCRA approved data sets



---

## Applications of LBA within Insurance

# Marketing

---

- Consumer data evolution
  - Most likely to purchase
    - Market to individuals with the high propensity to purchase your product
  - Most likely to retain
    - Market to those most likely to buy and keep your product
  - Most likely to remain healthy
    - Market to the healthiest individuals who are most likely to buy and keep your product

# Disease Management/Wellness

---

- An augment to traditional medical risk assessment
  - Speed up the prediction
- A determiner of the next event
  - Pre-diabetes
  - Hypertension
- Measurement of obesity
- Day one assessment of new populations
  - New plans
  - New members

# Underwriting

---

- Individual & Small Group Health Underwriting
  - Augment current techniques
- Medium Group Health Underwriting
  - Absence of medical data
- Preferred Underwriting
  - Predictor of the healthy (preferred)
- Tele-Underwriting
  - Criteria for identification
- Fraud Detection

# Conclusion

---

The real value of consumer data in the healthcare industry lies in its ability to predict lifestyle-based diseases

Whether used as a HIPAA compliant identifier for health risks or as an early predictor of a disease state, we see the use of Lifestyle-Based Analytics accelerating rapidly within the healthcare arena as earlier adopters see significant competitive advantages

---

# Deloitte.

## About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu, a Swiss Verein, its member firms and their respective subsidiaries and affiliates. As a Swiss Verein (association), neither Deloitte Touche Tohmatsu nor any of its member firms has any liability for each other's acts or omissions. Each of the member firms is a separate and independent legal entity operating under the names "Deloitte," "Deloitte & Touche," "Deloitte Touche Tohmatsu," or other related names. Services are provided by the member firms or their subsidiaries or affiliates and not by the Deloitte Touche Tohmatsu Verein.

Deloitte & Touche USA LLP is the U.S. member firm of Deloitte Touche Tohmatsu. In the U.S., services are provided by the subsidiaries of Deloitte & Touche USA LLP (Deloitte & Touche LLP, Deloitte Consulting LLP, Deloitte Financial Advisory Services LLP, Deloitte Tax LLP and their subsidiaries), and not by Deloitte & Touche USA LLP.

Member of  
**Deloitte Touche Tohmatsu**