WHY I WROTE THE LONGEVITY REVOLUTION

1) Status Report
   After 50 years
   Social-Economic, Medical, Political, Cultural Aspects

2) Address Paradox

3) Deal with: Misinformation, misunderstanding and myths.

4) Offer Solutions: Genuine Challenges

5) Agenda for Action

6) Sourcebook/Textbook/Public Education

Population Aging and Advancing Longevity Has Not Reached “Tipping Point.”
The Longevity Revolution

30 Years

 Advantage

↓ Disabilities

↑ Quality of Life

17% of Increase: 65+
Extending your own life expectancy is the most selfish motive imaginable for doing anything. Do it, by all means.
THE LONGEVITY REVOLUTION

Great Human Achievement

But

Grave Concerns of Some Economists, Policy-Makers, Politicians and Pundits
CONCERNS

• Can’t Afford Old People

• Economic Stagnation

• Intergenerational Conflicts
SOME SPECIFIC CHALLENGES

- Chronic Illness (The New Longevity 65+)
- Entitlements
- Ageism
BIGGEST CHALLENGE OF ALL

Denial

Getting Attention of:

Policy-Makers and Politicians
Public
Baby Boomers

The “Tipping Point”
SELECTED TOPICS COVERED
DISORDERS OF LONGEVITY

Barker’s Hypothesis

Lifespan Perspective

Diseases of Old Age Begin Early

Genes

Environment
DISORDERS OF LONGEVITY

- Fetal, Infant, and Childhood Origins—Genetic, Environmental, and Behavioral (such as low birth weight)
- Polygenic Disorders, such as coronary heart disease.
- Medicated and Surgical Survival and Success of Neonatology
- Lifelong Exposure to Environmental and Behavioral Factors
- Poor Lifestyle and “Wear and Tear”
DISORDERS OF LONGEVITY

- Accumulation of Deleterious Genetic Components Through Natural Selection
- Gompertz/Aging as Risk Factor/Declining “Defense” and “Repair” Mechanisms
- Prions (misfolded proteins) incubate for long periods of time.
- Conversion of some acute diseases to chronic diseases, (such as AIDS and some cancers)
- Late-Life Adverse Events, such as pneumonia.
EXAMPLES

Osteoporosis

Atherosclerosis
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Suicide Rate Per 100,000 Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older People (Ages 65+)</td>
<td>15.6</td>
</tr>
<tr>
<td>Young People (Ages 15-24)</td>
<td>9.9</td>
</tr>
<tr>
<td>All Ages</td>
<td>11</td>
</tr>
</tbody>
</table>

LACK OF PUBLIC KNOWLEDGE ABOUT SOCIAL SECURITY

THE RESULTS:

- Only half of all adults know that Society Security guarantees payment for life.

- Only a quarter of adults know that Social Security guarantees protection against inflation.

- Only about half of all adults know that Social Security provides life and disability coverage for spouses or children of workers who die or are disabled.

- Only about one adult in every six know that Social Security has lower administrative costs than private pension and retirement plans.

- Almost half of adults do not know that Social Security has never failed to pay benefits.

Source: Harris Poll with International Longevity Center (2005)
Ceiling on Wage Base

97,000 → 150,000

↓ 60% Social Security Shortfall
PRODUCTIVE ENGAGEMENT

Live Longer

↕

Work Longer
LIVING LONGER, WORKING LONGER

RETIRING BABY BOOMERS

GEPHARDT AND STOCKMAN

PILOTS – STERN'S
IMPACT OF RETIREMENT OF THE BABY BOOMERS

- About 50% of 1.6 million federal workers are eligible to retire by 2008.

- Nuclear power industry expects 28% of 58,000 workers to retire within 5 years; another 18% of young employees leave.

- By 2010, more than 40% of RNs will be over age 50; 50% of nurses will retire within 15 years.

- Record low number of students in petroleum engineering programs even as 60% of employees retire by 2010.

- Retirement of executive and managerial talent.

Source: David W. DeLong
Lost Knowledge, 2004
HEALTHCARE

THE BIG ISSUE
INADEQUATE ATTENTION

Structural Reform

Trained Workforce

Health Promotion and Disease Prevention

Research and Development
# HEALTH CARE EXPENDITURES PER CAPITA IN SELECTED COUNTRIES, 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Expenditures Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>$5,267*</td>
</tr>
<tr>
<td>Canada</td>
<td>$2,931</td>
</tr>
<tr>
<td>Germany</td>
<td>$2,817</td>
</tr>
<tr>
<td>U.K.</td>
<td>$2,161</td>
</tr>
</tbody>
</table>

* The U.S has the highest expenditures but the lowest life expectancy and highest infant mortality compared with these 3 countries.
THE QUALITY OF MEDICAL SERVICES VARIES WIDELY

• 3% of hospital patients hurt by medical error.

• 1 in 300 patients die from such mistakes.

• 90,000 people die from such mistakes.

• 180,000 elderly outpatients die or harmed by drug toxicity.

• 7,000 patients die annually from drug errors each year.

• 554 errors in four months were found at one six-bed intensive care unit – 147 were potentially serious or life-threatening.
THE QUALITY OF MEDICAL SERVICES VARIES WIDELY

- 55% of recommended care actually gets administered.

- $2,000 annual cost to employers per insured worker, due to poor quality care.

Compiled by Forbes magazine, Sources Lucian Leape, New England Journal of Medicine, CDC; Forbes, Journal of the American Medical Association, Institute of Medicine, Quality and Safety in Health Care, RAND, Midwest Business Group on Health.

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## Actual Causes of Death in the United States in 1990 and 2000

<table>
<thead>
<tr>
<th>Actual Cause</th>
<th>No. (%) in 1990*</th>
<th>No. (%) in 2000**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco</td>
<td>400,000 (19)</td>
<td>435,000 (18.1)</td>
</tr>
<tr>
<td>Poor Diet and Physical Activity</td>
<td>300,000 (14)</td>
<td>400,000 (16.6)</td>
</tr>
<tr>
<td>Alcohol Consumption</td>
<td>100,000 (5)</td>
<td>85,000 (3.5)</td>
</tr>
<tr>
<td>Microbial Agents</td>
<td>90,000 (4)</td>
<td>75,000 (3.1)</td>
</tr>
<tr>
<td>Toxic Agents</td>
<td>60,000 (3)</td>
<td>55,000 (2.3)</td>
</tr>
<tr>
<td>Motor Vehicle</td>
<td>25,000 (1)</td>
<td>43,000 (1.8)</td>
</tr>
<tr>
<td>Firearms</td>
<td>35,000 (2)</td>
<td>29,000 (1.2)</td>
</tr>
<tr>
<td>Sexual Behavior</td>
<td>30,000 (1)</td>
<td>20,000 (0.8)</td>
</tr>
<tr>
<td>Illicit Drug Use</td>
<td>20,000 (&gt;1)</td>
<td>17,000 (0.7)</td>
</tr>
<tr>
<td>Total</td>
<td>1,060,000 (50)</td>
<td>1,159,000 (48.2)</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Industry</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care</td>
<td>$325</td>
</tr>
<tr>
<td>Communications, Technology</td>
<td>$283</td>
</tr>
<tr>
<td>Finance, Insurance</td>
<td>$279</td>
</tr>
<tr>
<td>Business, Retail, Services</td>
<td>$165</td>
</tr>
<tr>
<td>Transportation</td>
<td>$162</td>
</tr>
<tr>
<td>Energy, Natural Resources</td>
<td>$157</td>
</tr>
</tbody>
</table>
AMOUNT SPENT ON FEDERAL LOBBYING IN 2004, IN MILLIONS OF DOLLARS

Defense $ 93
Single-Issue Groups* $ 90
Manufacturing $ 88
Agriculture $ 79

Sources: Political Money Line; Secretary of the Senate; Clerk of the House

* Includes abortion, environment and gun control groups.
PEOPLE WANT TO STAY AT HOME AS LONG AS POSSIBLE

Paid Home Health Aides

↓

Nursing Shortages
STRUCTURAL REFORMS

From

Health Promotion and Disease Prevention

To

Long Term Care

To

End of Life Care
ADMINISTRATIVE COSTS

Medicare – 2%

Private Health Insurance:

Up to 20%
PRIVATE HEALTH INSURANCE

Marketing

Advertizing

Selling

Profits

Medicare Advantage – Costs 12% More
Redesigning Healthcare for All Americans
And An Older America

Not Really On
The Political Agenda
New Paradigm

↓

Basic Biology of Aging
AGEISM

No Minimum Wage for Home Health Aides

9 of 10 Nursing Homes – Do Not Meet Federal Standards for Personnel

Clinical Trials – No FDA Requirement to Include Older Persons

Post-Marketing – Drug Safety
ALZHEIMER’S DISEASE

LITTLE PROGRESS

CENTURY OF THE BRAIN
QUALITY OF LIFE

CAUTIONS
INEQUALITY OF LONGEVITY

GLOBAL ECONOMY

DANGER TO US
THREATS

Shortgevity

Africa

USSR

Avian Flu
CALL TO ACTION

Chronic Diseases

Surpassed

Infectious Diseases
CALL TO ACTION

Worldwide

Millennial Goals

6 Vaccine-Preventable Diseases

Micronutrients

Mosquito Netting
Health and Longevity

→ Wealth

vs.

Economic Stagnation
1. Follow the Individual Through Life

2. Silver Industries
“SILVER INDUSTRIES”
OR
THE MATURE MARKET

Financial Services
Legal Services
Healthcare Services
Housing and Living Arrangements
Travel and Hospitality
INTERGENERATIONAL CONFLICTS

None

U.S.

and

France
## DEPENDENCY RATIO: COMPARISON OF NUMBERS OF PERSONS UNDER 18 AND OVER 65 (THE “DEPENDENTS”) TO THE MIDDLE GENERATIONS (THE “WORKERS”)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Persons Under age 18 per 100 Persons Age 18 to 64</th>
<th>Number of Persons Age 65+ Per 100 Persons Age 18 to 64</th>
<th>Total Number of “Dependents” Per 100 “Workers”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Estimates:</td>
</tr>
<tr>
<td>1900</td>
<td>72.6</td>
<td>7.3</td>
<td>79.9</td>
</tr>
<tr>
<td>1910</td>
<td>65.7</td>
<td>7.5</td>
<td>73.2</td>
</tr>
<tr>
<td>1920</td>
<td>64.0</td>
<td>8.0</td>
<td>72.0</td>
</tr>
<tr>
<td>1930</td>
<td>58.6</td>
<td>9.1</td>
<td>67.7</td>
</tr>
<tr>
<td>1940</td>
<td>48.8</td>
<td>10.9</td>
<td>59.7</td>
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<tr>
<td>1950</td>
<td>51.1</td>
<td>13.4</td>
<td>64.5</td>
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<tr>
<td>1960</td>
<td>65.3</td>
<td>16.9</td>
<td>82.2</td>
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<tr>
<td>1970</td>
<td>61.1</td>
<td>17.6</td>
<td>78.7</td>
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<tr>
<td>1980</td>
<td>46.2</td>
<td>18.7</td>
<td>64.9</td>
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<tr>
<td>1990</td>
<td>41.7</td>
<td>20.3</td>
<td>62.0</td>
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<tr>
<td>1995</td>
<td>42.7</td>
<td>20.9</td>
<td>63.6</td>
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<td>2000</td>
<td>41.3</td>
<td>20.4</td>
<td>61.7</td>
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<tbody>
<tr>
<td>2005</td>
<td>39.8</td>
<td>20.2</td>
<td>60.0</td>
</tr>
<tr>
<td>2010</td>
<td>38.3</td>
<td>21.1</td>
<td>59.4</td>
</tr>
<tr>
<td>2020</td>
<td>39.8</td>
<td>27.7</td>
<td>67.5</td>
</tr>
<tr>
<td>2030</td>
<td>42.1</td>
<td>35.6</td>
<td>77.7</td>
</tr>
<tr>
<td>2040</td>
<td>42.1</td>
<td>36.5</td>
<td>78.6</td>
</tr>
<tr>
<td>2050</td>
<td>39.0</td>
<td>33.4</td>
<td>72.4</td>
</tr>
</tbody>
</table>
FOCUS IN USA

Medicine, Nursing and Social Work

GACA

Medicare

Gerontology

Interdisciplinary
Extraordinarily Important

Need for Visionary Leadership
Poverty Line for 65+ Percentage of the 65+ population below the poverty line 9.42%:

- $9,669/Year or Less
  - About $185/Week or Less
  - About $26/Day or Less

Poverty: Percentage of the 65+ Population below 125% of Poverty line: 16.65%:

- $12,086/Year or Less
  - About $232/Week or Less
  - About $33/Day or Less

Poverty: Percentage of the 65+ Population below 150% the poverty line: 22.35%:

- $14,503/Year or Less
  - About $279/Week or Less
  - About $39/Day or Less

### Social Security

Cost-of-Living adjustment: up 4.1%.

Average monthly benefit in 2005: $963.

Average monthly benefit in 2006: $1,002

### Medicare Part B

Monthly premium: $88.50 (up $10.30 from 2005)

**Part D**: (Drug Benefit)

Average monthly premium: $32.

### Inflation (9 months since Jan. 1, 2005):

- up 5.1%
- Energy Prices: up 42.5%
- Food Prices: up 2.1%
- Medical Care Costs: up 4%
"If we take a late retirement and an early death, we'll just squeak by."
Brain Health or Cognitive Vitality

Physical Activity

Intellectual Stimulation
Computers

Language

Musical Instruments
Vascular Risk Factors

- Hypertension
- Diabetes
- Heart Disease
- Middle-Aged Spread (Obesity)
Life Review

Coming to Terms
Geriatric Psychiatry

Leadership re Aging in America

Reimbursement Parity
Drug Safety

FDA/Clinical Trials

FDA/Post-Marketing Surveillance
“This will lighten your mood, Dick—every few minutes, a baby boomer turns fifty.”
THE FUTURE

BOOMERS: TRANSFORMATIVE BUT AT RISK

GENOMICS AND REGENERATIVE MEDICINE