EPIDEMIOLOGY OF AGING

• DEFINITION AND INTRODUCTION TO RESEARCH IN THIS AREA

• PRESENTATION OF AGING AND PHYSICAL ACTIVITY AS AN EXEMPLAR FOR RESEARCH IN THE EPIDEMIOLOGY OF AGING
EPIDEMIOLOGY OF AGING

• THE STUDY OF THE AGE-RELATED DISTRIBUTION AND CAUSES OF DISEASE, DISABILITY, AND MORTALITY IN HUMAN POPULATIONS.
EPIDEMIOLOGY OF AGING

• CHRONOLOGICAL AGE IS ASSOCIATED WITH INCIDENCE AND PREVALENCE OF MOST HEALTH OUTCOMES.

• DESPITE THIS AGE ASSOCIATION, THERE IS CONSIDERABLE VARIATION IN HEALTH OUTCOMES WITHIN AGE CATEGORIES.
EPIDEMIOLOGY OF AGING

• WHY ARE OLDER PEOPLE AT ELEVATED RISK FOR DISEASE, DISABILITY, AND DEATH?
EPIDEMIOLOGY OF AGING

- ACCUMULATION OF ENVIRONMENTAL/BEHAVIORAL INSULTS.
- REDUCED IMMUNOLOGICAL SURVEILLANCE
EPIDEMIOLOGY OF AGING

• WHY IMPORTANT?
  – AGING OF THE HUMAN POPULATION
  – HEALTH AND VITALITY OF AN AGING POPULATION
  – QUALITY OF LIFE AND COST OF CARE
**EPIDEMIOLOGY OF AGING**

- **AGING OF THE U.S. POPULATION, PERCENTAGE AGED 65+ YEARS BY YEAR**

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td>4.0%</td>
</tr>
<tr>
<td>1940</td>
<td>8.0%</td>
</tr>
<tr>
<td>1980</td>
<td>11.5%</td>
</tr>
<tr>
<td>2000</td>
<td>12.6%</td>
</tr>
<tr>
<td>2030</td>
<td>20.0%</td>
</tr>
</tbody>
</table>
EPIDEMIOLOGY OF AGING

• THERE IS CONSIDERABLE VARIABILITY BY REGION OF THE COUNTRY, 2000

  – FLORIDA 18.1%
  – CALIFORNIA 10.4%
  – ALASKA 5.8%
### Epidemiology of Aging

**Race, Ethnicity, and Age, U.S.**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>2000</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH white</td>
<td>83.5%</td>
<td>64.2%</td>
</tr>
<tr>
<td>NH black</td>
<td>8.1</td>
<td>12.2</td>
</tr>
<tr>
<td>NH Asian/PI</td>
<td>2.4</td>
<td>6.5</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.6</td>
<td>16.4</td>
</tr>
</tbody>
</table>
EPIDEMIOLOGY OF AGING

• MAJOR AGE-ASSOCIATED CAUSES OF DEATH
  – CARDIOVASCULAR DISEASE
  – CANCER
  – CHRONIC OBSTRUCTIVE PULMONARY DISEASE
  – DIABETES
**AGE-SPECIFIC COLORECTAL CANCER INCIDENCE RATES**
(Per 100,000 in population)

<table>
<thead>
<tr>
<th></th>
<th>WM</th>
<th>WF</th>
<th>BM</th>
<th>BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;65</td>
<td>20.4</td>
<td>14.7</td>
<td>25.3</td>
<td>20.4</td>
</tr>
<tr>
<td>65+</td>
<td>408.0</td>
<td>269.3</td>
<td>385.8</td>
<td>286.1</td>
</tr>
</tbody>
</table>
### EPIDEMIOLOGY OF AGING

#### COGNITIVE FUNCTION

- **Moderate/Severe Memory Impairment**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>5.3</td>
<td>3.8</td>
</tr>
<tr>
<td>85+</td>
<td>37.3</td>
<td>35.0</td>
</tr>
</tbody>
</table>
• Moderate or severe memory impairment defined as four or fewer words recalled (out of 20) on combined immediate and delayed recall tests. Source: Health and Retirement Survey.
## Epidemiology of Aging

### Depressive Symptoms

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>12.1</td>
<td>18.0</td>
</tr>
<tr>
<td>85+</td>
<td>22.5</td>
<td>23.0</td>
</tr>
</tbody>
</table>

---

**Note:** The data reflects the prevalence of depressive symptoms in males and females across the specified age groups.
EPIDEMIOLOGY OF AGING

• DEPRESSIVE SYMPTOMS ARE DEFINED AS FOUR OUT OF EIGHT SYMPTOMS FROM AN APPREVIATED CES-D SCALE.

• SOURCE: HEALTH AND RETIREMENT SURVEY
## Epidemiology of Aging

### Percent of Men and Women Aged 60+ Reporting Two or More Health Conditions

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-69</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>70-79</td>
<td>47</td>
<td>61</td>
</tr>
<tr>
<td>80+</td>
<td>53</td>
<td>70</td>
</tr>
</tbody>
</table>
EPIDEMIOLOGY OF AGING

• FUNCTIONAL LIMITATIONS AND DISABILITIES

• FALLS, INJURIES, ACCIDENTS
EPIDEMIOLOGY OF AGING

• FUNCTIONAL LIMITATIONS – DIFFICULTIES IN THE PERFORMANCE OF GENERIC TASKS, E.G., THOSE RELATED TO UPPER- AND LOWER-BODY STRENGTH, BALANCE, AND FINE DEXTERITY.
EPIDEMIOLOGY OF AGING

• DISABILITY – DIFFICULTY OR INABILITY IN THE PERFORMANCE OF A SOCIAL ROLE CAUSED BY A PHYSICAL OR COGNITIVE PROBLEM.
EPIDEMIOLOGY OF AGING

• FALLS

• 30% OF PEOPLE AGED 65+ FALL EACH YEAR.
• 10-15% OF THOSE FALLS ARE CONSIDERED “SERIOUS/NON-FATAL”
• FALLS REPRESENT THE LEADING CAUSE OF ACCIDENTAL DEATH IN PEOPLE AGED 65 AND OLDER.
• FEAR OF FALLING IS A LEADING REASON FOR NOT ENGAGING IN PHYSICAL ACTIVITY.
EPIDEMIOLOGY OF AGING

• CAUSES OF FALLS IN THE ELDERLY
  • - DIZZINESSNESS
  • - POOR COGNITIVE FUNCTION
  • - VISION PROBLEMS
  • - GENERAL FRAILTY
  • - ENVIRONMENTAL HAZARDS
EPIDEMIOLOGY OF AGING

- HEALTH PROMOTION
  - NATIONAL INSTITUTE ON AGING STRATEGIC PLAN FOR 2001-05
  - CENTERS FOR DISEASE CONTROL, AGING WHITE PAPER
EPIDEMIOLOGY OF AGING

• NIA STRATEGIC PLAN – PHYSICAL ACTIVITY
  
  Delay the onset of disabilities and disease
  Reduce the risk of falls and fractures
  Improve mood and depression
  Increase life span
EPIDEMIOLOGY OF AGING

• CDC PLAN
  – Key Component to Healthy Aging
  – Increases strength
  – Reduces risk of death
  – Improves mood
  – Improves muscular performance, flexibility, and mobility
• If it’s such a good thing......

- Many Americans are not engaging in physical activity.

- Although more and more older adults are aware of the benefits of physical activity, only one-third exercise regularly.
EPIDEMIOLOGY OF AGING

• STUDY OF PHYSICAL PERFORMANCE AND AGE-RELATED CHANGES IN SONOMANS (SPPARCS PROJECT)
  - Sonoma residents aged 55 and older (n = 2096)
  - Home and laboratory assessments. Four assessments over a 8.5 year period.
  - Focus on the effects of leisure-time physical activity and health, functioning, and survival.
EPIDEMIOLOGY OF AGING

- ECOLOGICAL MODEL

- DIFFERENCES IN HEALTH AND WELL BEING ARE AFFECTED BY A DYNAMIC INTERACTION BETWEEN BIOLOGY, BEHAVIOR, AND THE ENVIRONMENT.

- INTERACTION UNFOLDS OVER THE LIFE COURSE OF INDIVIDUALS, FAMILIES, AND COMMUNITIES.

- AGE, GENDER, RACE, ETHNICITY, AND SOCIOECONOMIC DIFFERENCES SHAPE THE CONTEXT OF THAT INTERACTION.
ECOLOGICAL MODEL

MULTIPLE POINTS OF INTERVENTION TO POSTPONE DISEASE, DISABILITY, AND DEATH; AND ENHANCE THE CHANCES FOR HEALTH, MOBILITY, AND LONGEVITY.
EPIDEMIOLOGY OF AGING

- PHYSICAL ACTIVITY ....
  - DECLINES WITH AGE
  - MEDICAL AND NON-MEDICAL CAUSES
EPIDEMIOLOGY OF AGING

- Females aged 55-64 are more likely than men of the same age to limit or avoid LTPA because of the absence of an exercise companion.

- Nearly 1/3 of women aged 75+ report the absence of an exercise companion as a leading reason.

- Among married couples, the LTPA of the spouse was the best predictor of the subject’s LTPA.
EPIDEMIOLOGY OF AGING

• WHY IS THE ABSENCE OF AN EXERCISE COMPANION MORE SERIOUS FOR FEMALES THAN FOR MALES?
EPIDEMIOLOGY OF AGING

- PERCENT AGED 65+ MARRIED BY GENDER IN THE U.S.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>75.1%</td>
<td>42.9%</td>
</tr>
</tbody>
</table>
EPIDEMIOLOGY OF AGING

• STRATEGIES TO ENHANCE HEALTH AND FUNCTIONING THROUGH PHYSICAL ACTIVITY
  – RWJ PROGRAM IN “ACTIVE FOR LIFE”
  – RWJ PROGRAM IN “ACTIVE ENVIRONMENTS”