# ABC'S OF MILLION HEARTS

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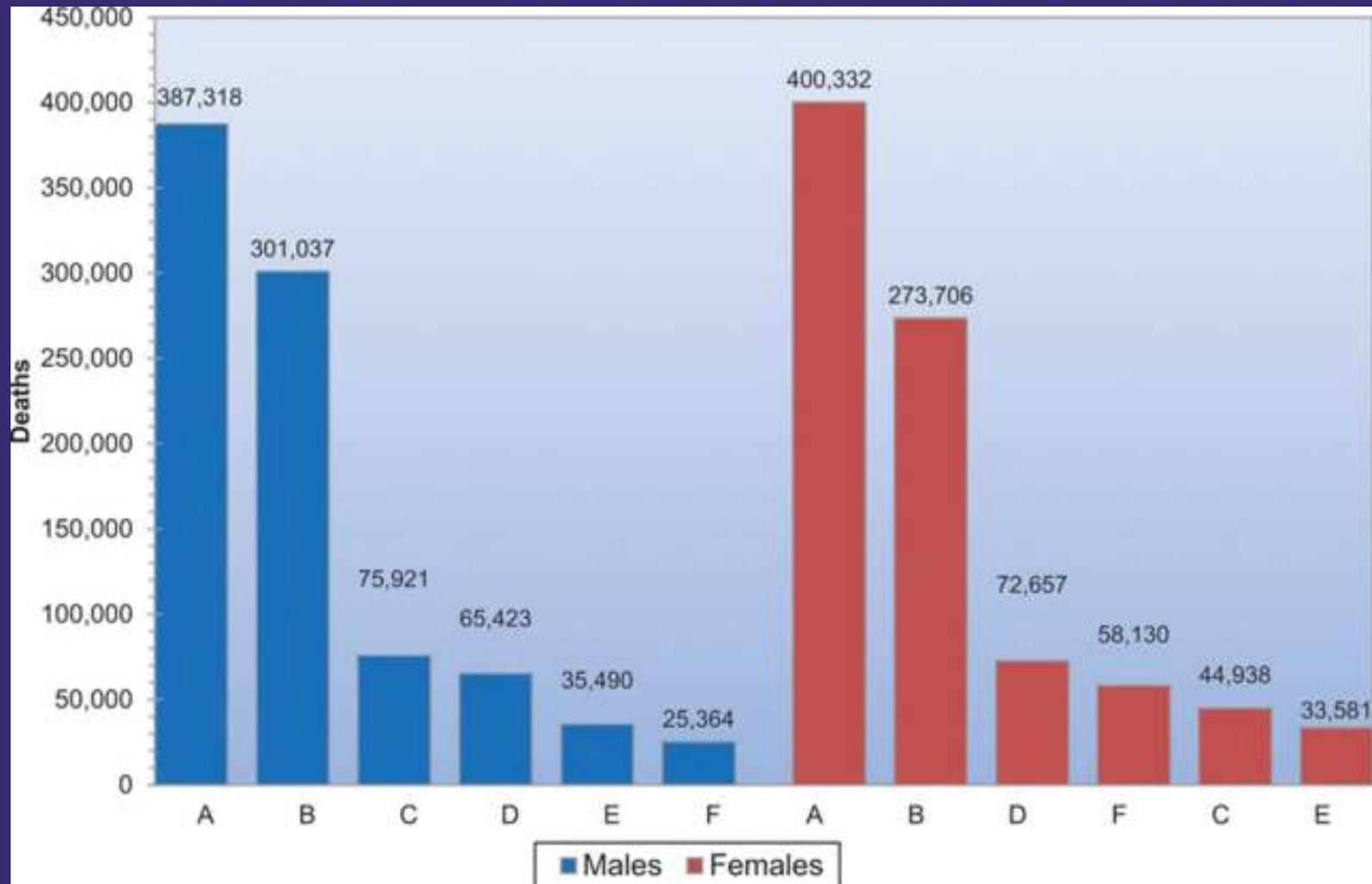
What is Cardiovascular Disease?

▣ **Diseases of the heart –** cardio **and Blood Vessels -** vascular

- Hypertension
- Coronary artery disease: **Blockages in the arteries of the heart reducing blood flow**
- Stroke: **Blockages in the arteries of the brain reducing blood flow**

Coronary Arteries of the Heart
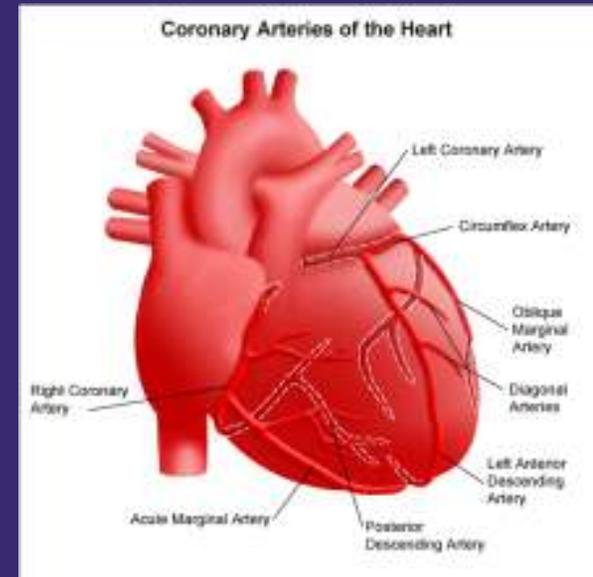
Prevalence of People with Cardiovascular Disease

Alan S. Go et al. Circulation. 2014;129:e28-e292
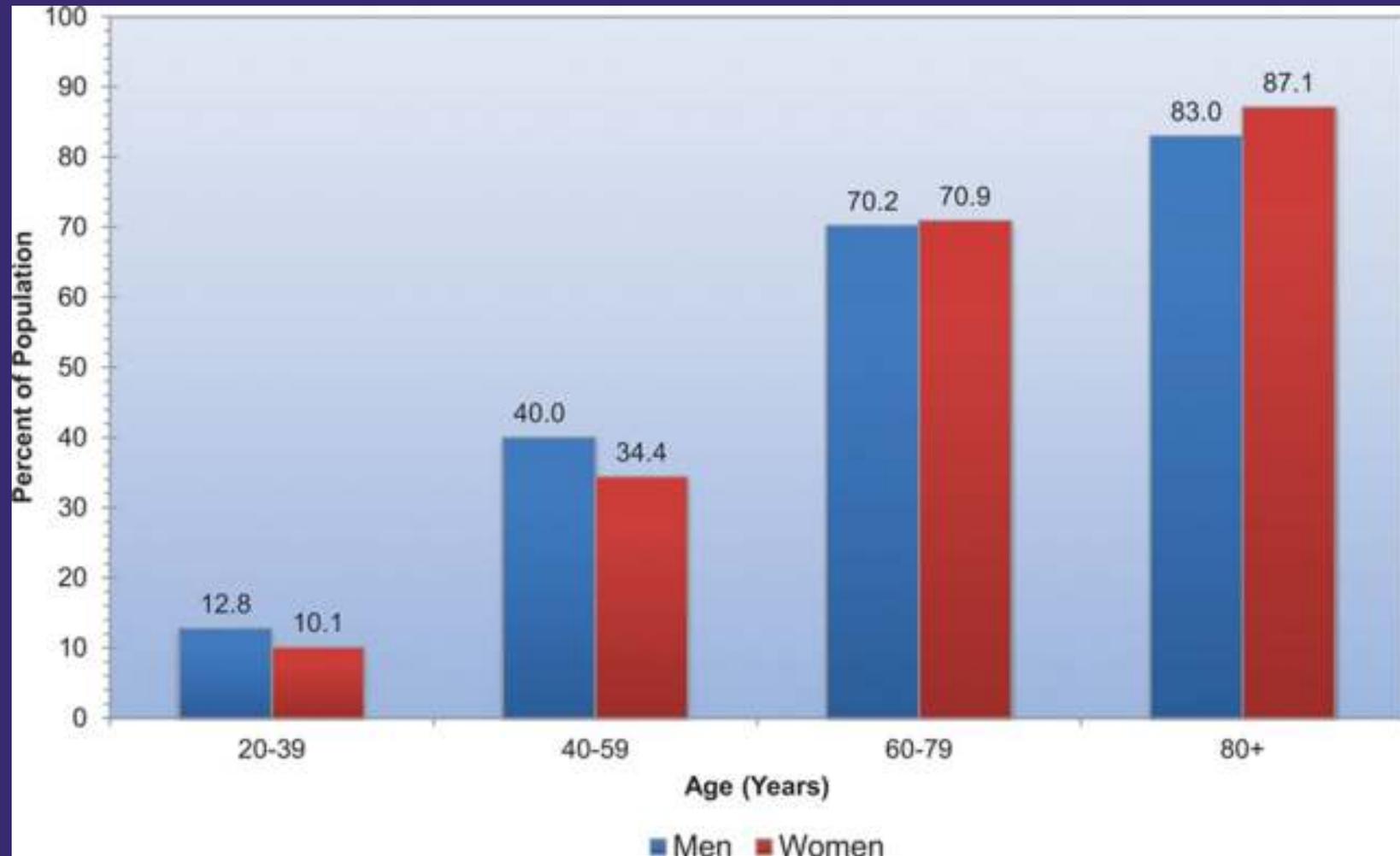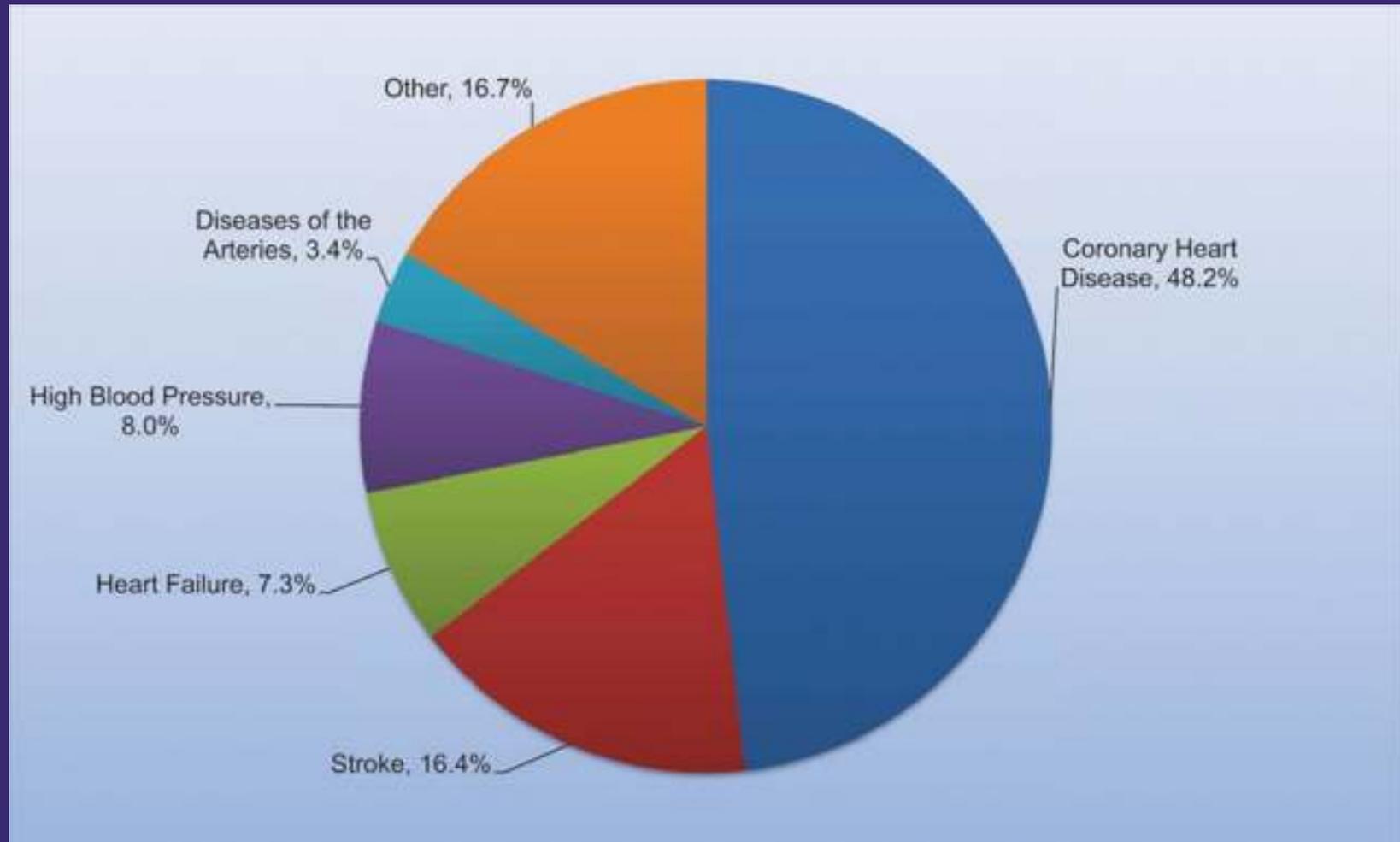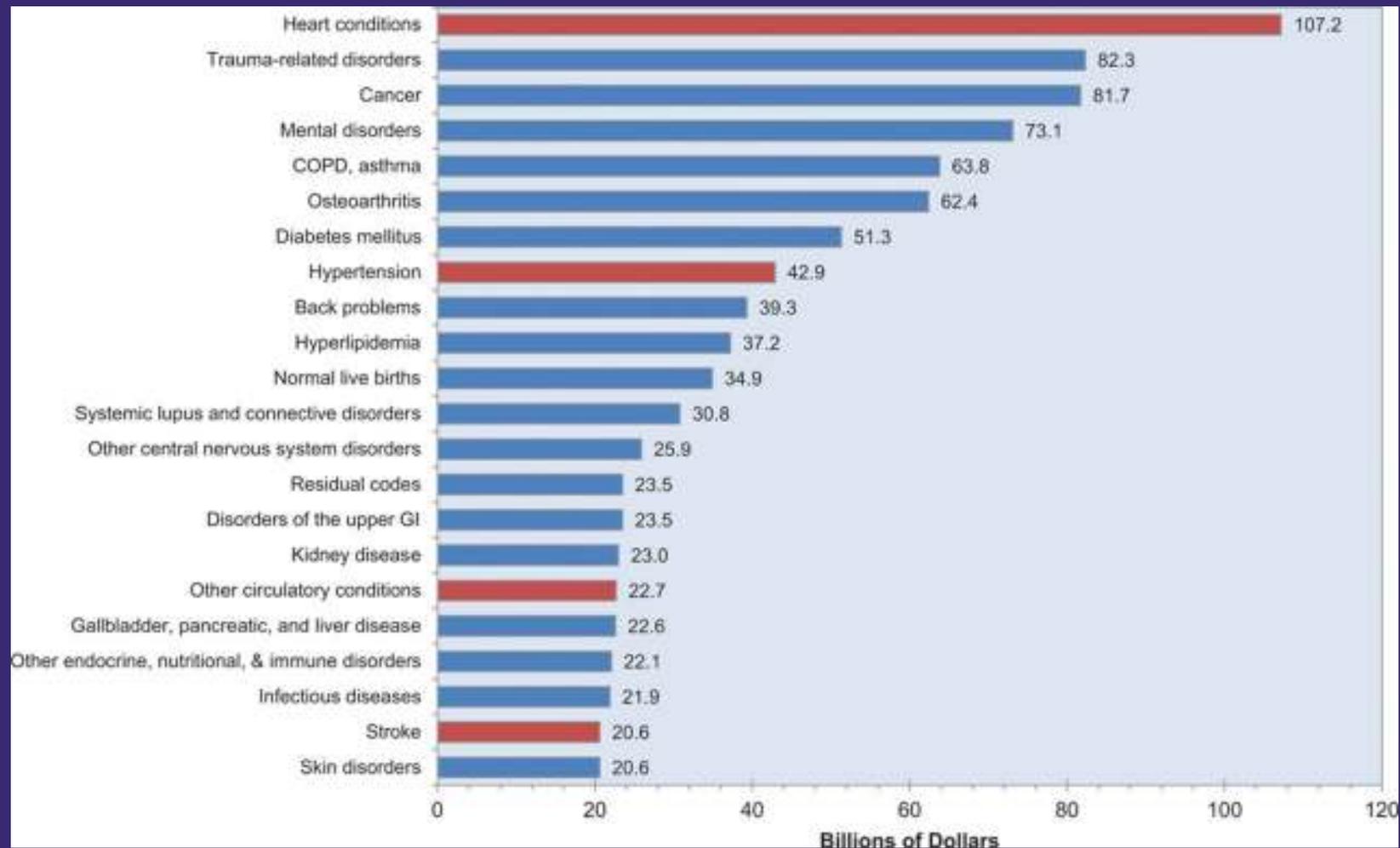
Causes of Death in US

A. Cardiovascular Disease
B. Cancer
C. Accidents
D. Chronic Lower Respiratory Disease
E. Diabetes Mellitus
F. Alzheimer Disease

Percentage breakdown of deaths attributable to cardiovascular disease (United States: 2010)

Other, 16.7%

Diseases of the Arteries, 3.4%

High Blood Pressure, 8.0%

Heart Failure, 7.3%

Stroke, 16.4%

Coronary Heart Disease, 48.2%

The 22 leading diagnoses for direct health expenditures, United States, 2010 (in billions of dollars).

Diagnosis	Billions of Dollars
Heart conditions	107.2
Trauma-related disorders	82.3
Cancer	81.7
Mental disorders	73.1
COPD, asthma	63.8
Osteoarthritis	62.4
Diabetes mellitus	51.3
Hypertension	42.9
Back problems	39.3
Hyperlipidemia	37.2
Normal live births	34.9
Systemic lupus and connective disorders	30.8
Other central nervous system disorders	25.9
Residual codes	23.5
Disorders of the upper GI	23.5
Kidney disease	23.0
Other circulatory conditions	22.7
Gallbladder, pancreatic, and liver disease	22.6
Other endocrine, nutritional, & immune disorders	22.1
Infectious diseases	21.9
Stroke	20.6
Skin disorders	20.6

Risk Factors for Cardiovascular Disease
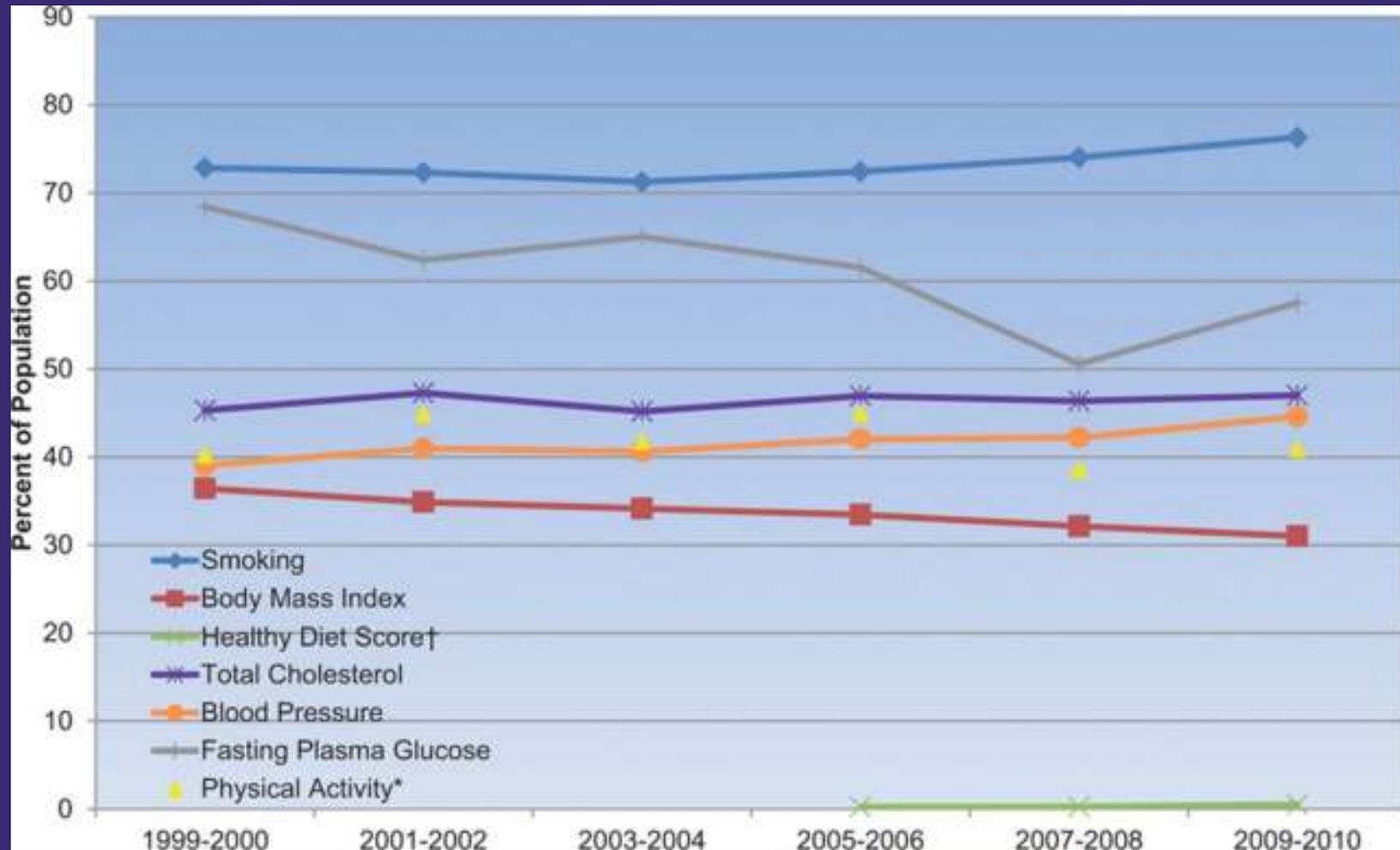
- Some risk factors CANNOT be controlled
  - Increasing Age
  - Family history
  - Race
  - Prior heart attack or stroke
- Some risk factors CAN be controlled
  - Hypertension   - Diabetes
  - High Cholesterol - Inactivity
  - Smoking   - Obesity

Adults Meeting Goals of Reducing Risk Factors

Alan S. Go et al. Circulation. 2014;129:e28-e292

How to Reduce Risk of Cardiovascular Disease?

ABCS OF CARDIOVASCULAR DISEASE

ABCS OF CARDIOVASCULAR DISEASE

Aspirin

Risk Assessment Tool

- **Risk Assessment Tool for Estimating 10-year Risk of Having a Myocardial Infarction**

- Age
- Gender
- Total Cholesterol
- HDL Cholesterol
- Smoker
- Systolic Blood Pressure
- Medication for Hypertension

- http://cvdrisk.nhlbi.nih.gov/calculator.asp

Risk Assessment Tool

- **Risk Assessment Tool for Estimating 10-year Risk of Having a Stroke**

- Age
- Gender
- Atrial Fibrillation
- Left Ventricular Hypertrophy
- Smoker
- Systolic Blood Pressure
- Diabetes
- Prior Cardiac Disease
- Medication for Hypertension

- http://westernstroke.org

Aspirin

- In high risk patients, can decrease risk of cardiovascular events

  - Decreases the risk of myocardial infarctions in high risk men
    - 32% relative risk reduction

  - Decreases the risk of stroke in high risk women
    - 17% relative risk reduction

Net Benefit From Aspirin Use

| Age	10-year MI risk (Men)	Age	10-year Stroke Risk (Women
45-59	>4%	55-59	>3%
60-69	>9%	60-69	>8%
70-79	>12%	70-79	>11%

ABCS OF CARDIOVASCULAR DISEASE

Blood Pressure

Hypertension-Problem Magnitude

- Hypertension(HTN) is the **most common** primary diagnosis in America.
- 35 million office visits are as the primary diagnosis of HTN.
- 50 million or more Americans have high BP.
- Worldwide prevalence estimates for HTN may be as much as 1 billion.
- 7.1 million deaths per year may be attributable to hypertension.

Benefits of Treatment

- Reductions in **stroke** incidence ~ 35–40%

- Reductions in **MI**, ~ 20–25 %

- Reductions in **heart failure**, >50 %
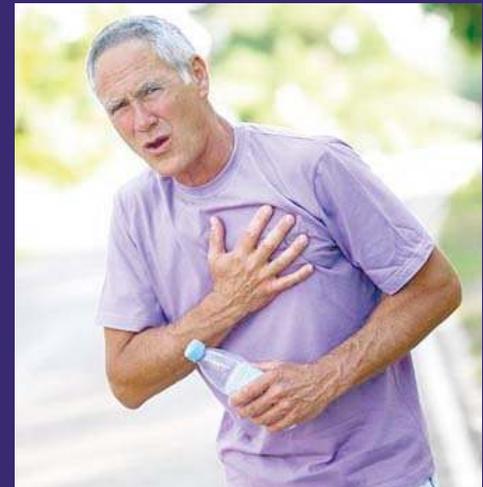
Goals of Treatment – JNC VIII

- Patients < 60 years,
  - goal <140/90 mm Hg

- Patients ≥ 60 years
  - goal ≤150 mm Hg systolic or ≤90 mm Hg diastolic

Goals of Treatment – JNC VIII

- Patient $\geq$ 18 with chronic kidney disease or diabetes
  - goal <140/90 mm Hg

Lifestyle Modification

Modification	Approximate SBP Reduction (range)
Weight reduction	5-20 mmHg/ 10 kg weight loss
Adopt DASH eating plan	8-14 mmHg
Dietary sodium reduction	2-8 mmHg
Physical activity	4-9 mmHg
Moderation of alcohol consumption	2-4 mmHg

Pharmacologic Therapy

Consider:

- Severity of BP
- End organ damage
- Presence of other conditions or risk factors

- 50% of patients controlled with one drug; another 30% with two
- The vast majority of patients with diabetes require two or more drugs

Impact of a 5 mmHg Reduction

	Overall Reduction
Stroke	14%
Coronary Heart Disease	9%
All Cause Mortality	7%

ABCS OF CARDIOVASCULAR DISEASE

Cholesterol

Lipoprotein Profile Classification

- LDL Cholesterol
  - < 70   Optimal in HRP
  - < 100   Optimal
  - 100-129 Near Optimal
  - 130-159 Borderline High
  - 160-189 High
  - 190+   Very High

- HDL Cholesterol
  - < 40   Low
  - 60+   High

- Total Cholesterol
  - < 200   Desirable
  - 200-239 Borderline High
  - 240+   High

- Triglycerides
  - < 150   Normal
  - 150-199 Borderline High
  - 200-499 High
  - 500+   Very High

ATP-III: Example of Risk Categories and LDL-C Goals

Risk category	Conditions and risk factors	LDL-C goal
High	Coronary heart disease (CHD), non-coronary atherosclerosis, diabetes	<100
Intermediate	Multiple (2+) risk factors*	<130
Low	0–1 risk factors	<160

Medium/High Intensity Diet and/or Physical Activity Counseling: Does It Work?

Primary outcomes

- ↓% energy saturated fat: 2.8–3.7%

- ↑fruit and vegetable: 0.4–2 serving/day

- ↑PA: 38 min/week

Secondary outcomes

- ↓LDL-C: 5.0 mg/dL

- ↓BMI: 0.3–0.7 kg/m2

- ↓SBP: 1.5 mmHg

- ↓DBP: 0.7 mmHg

Estimated Benefits of Lowering LDL-C by 39 mg/dL Using Statins in Adults

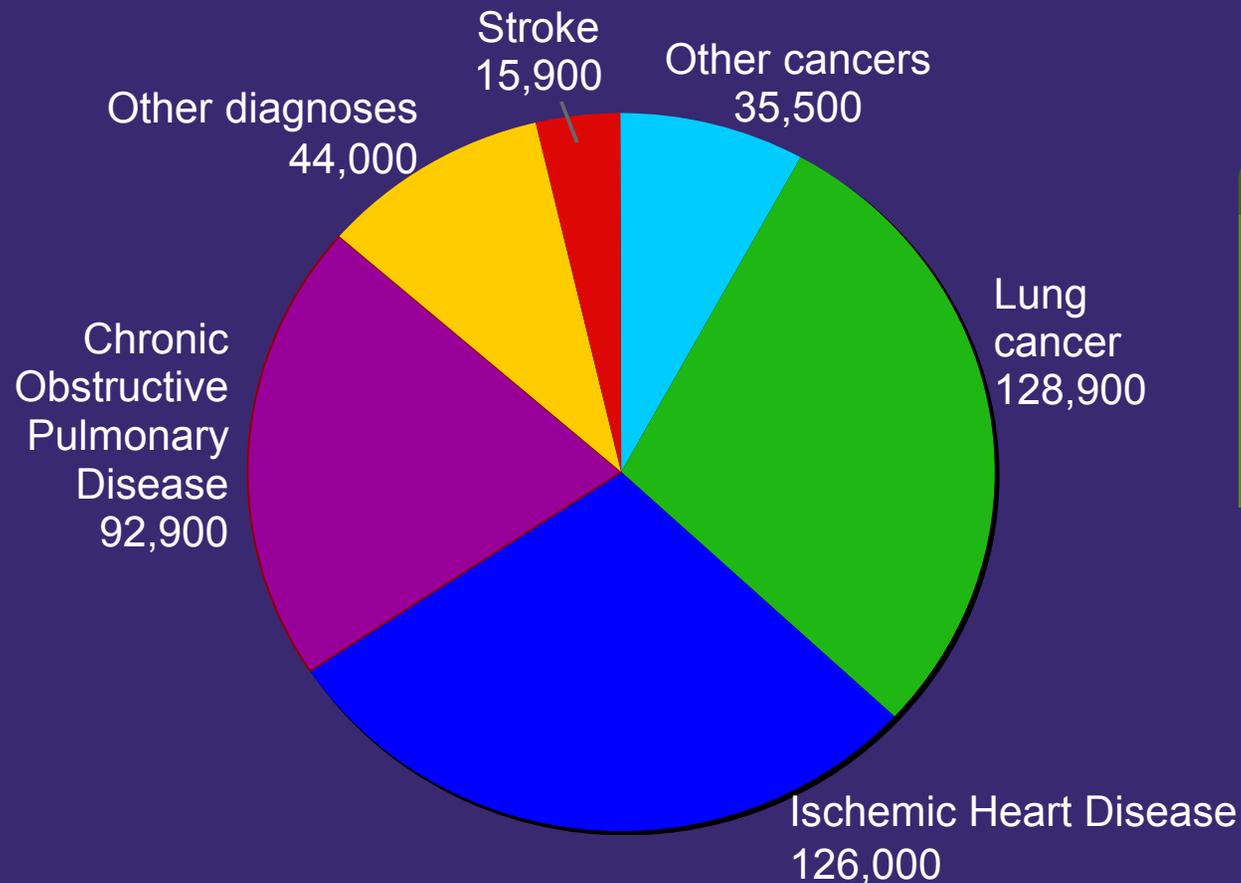| Outcomes	Magnitude of risk reduction, %	
	Point estimate	95% confidence intervals
Major coronary event	24%	21–27
Any stroke	15%	11–20
Major vascular event	21%	19–23
Vascular mortality	12%	9–16
Major vascular events: major coronary event (nonfatal myocardial infarction or coronary death), any stroke, and coronary revascularizations		

ABCS OF CARDIOVASCULAR DISEASE

Smoking

Smoking and Heart Disease

Smoking:

- Causes plaque to form blocking blood vessels

- May cause clots to form in arteries

- Reduces HDL ("good") cholesterol

- May cause irregular heart rhythms that could lead to cardiac arrest

- Stopping decreases mortality from heart attacks by 25-50%

About 443,000 U.S. Deaths per Year Attributable to Cigarette Smoking

Stroke
15,900

Other cancers
35,500

Other diagnoses
44,000

Lung cancer
128,900

Chronic Obstructive Pulmonary Disease
92,900

Ischemic Heart Disease
126,000

EVERY YEAR:

- **$96 billion in medical costs**

- **$97 billion in lost productivity**

Average annual number of deaths, 2000-2004.
Source: *CDC*. Smoking-attributable mortality, years of potential life lost, and productivity losses – United States, 2000-2004.
MMWR 2008;57(45):1226-1228.

Health Benefits of Quitting

CARDIOVASCULAR

- 1 year after quitting, <u>heart attack</u> risk drops sharply
- 2-5 years after quitting, <u>stroke</u> risk reduces to level of nonsmoker

CANCER

- 5 years after quitting, risks of several <u>cancers</u> fall by 50%
- 15 years after quitting, risk of dying from <u>lung cancer</u> falls by 50%

Health Benefits of Quitting Smoking

50-year Prospective Study of 34K MDs

Age at Quitting	Life Gain
60	3 yrs
50	6 yrs
40	9 yrs
30	10 yrs

The earlier a patient quits, the better, but quitting at any age is beneficial.

Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. British Medical Journal 2004;328: 1519

Smoking Cessation

- Goal is Complete Cessation!

- Strongly encourage patient and family to stop smoking and to avoid secondhand smoke.

- Provide counseling, pharmacological therapy, and formal smoking cessation programs as appropriate

ABCS OF CARDIOVASCULAR DISEASE

Aspirin
Blood Pressure
Cholesterol
Smoking

Thank You!