

# The Nursing Shortage: Projecting the Adequacy of the Future Supply of RNs

2004 ANA Biennial Convention  
Session SC084  
June 28

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# Agenda

- Overview of the National Center for Health Workforce Analysis, BHPPr, HRSA
  - Nursing Supply Model (NSM)
  - Nursing Demand Model (NDM)
- Adequacy of Future RN Supply
- Alternative Supply and Demand Scenarios
- Implications and Additional Research

# Nursing Supply Model Overview

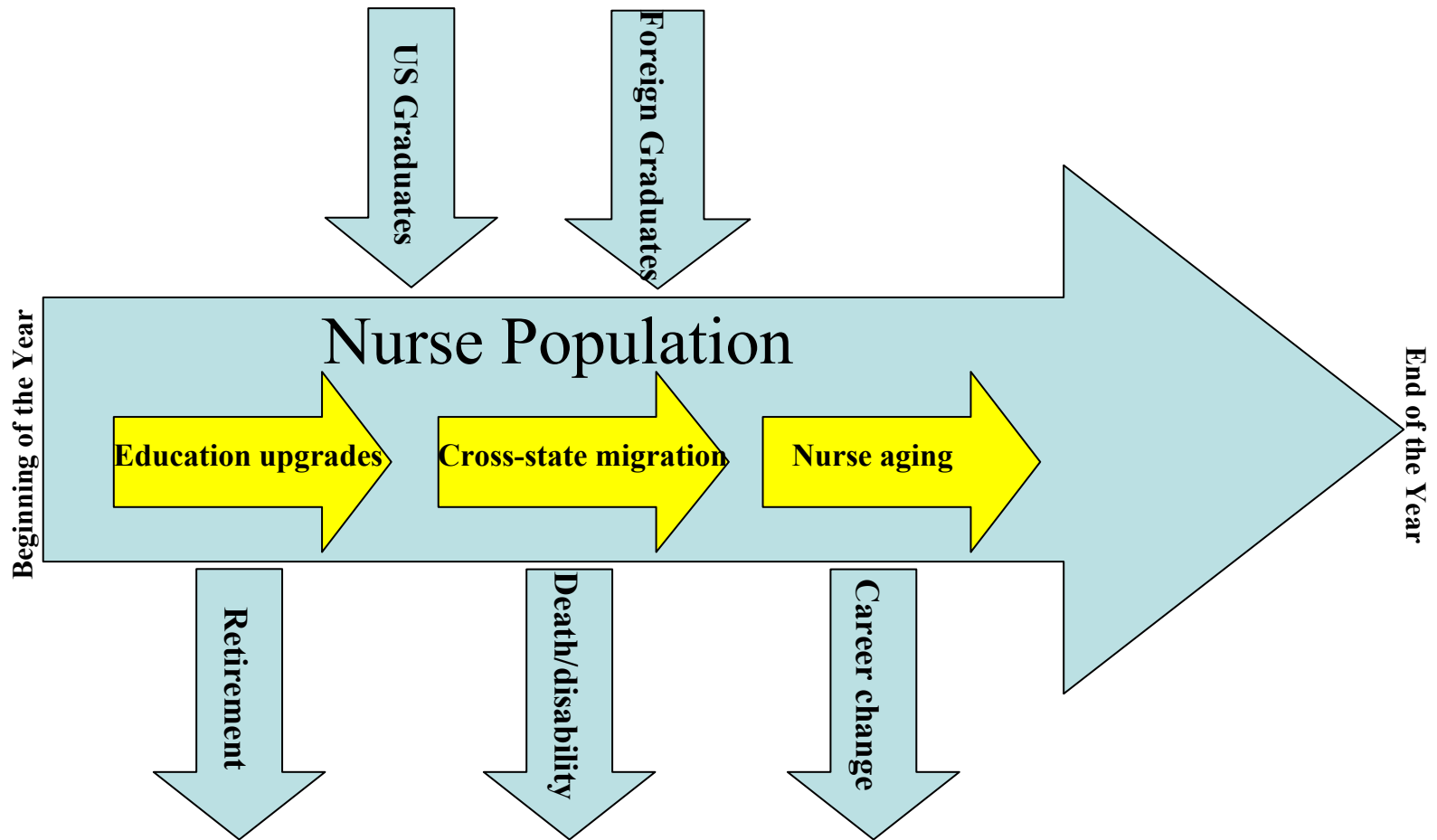
# NSM Projection Dimensions

- 50 States plus the District of Columbia
- Three education levels
  - Diploma and associates degree
  - Baccalaureate degree
  - Masters or higher degree
- RN age
- Years 2000 to 2020

# NSM Projection Determinants

- New graduates from U.S. nursing schools
- Immigration of RNs from outside the U.S.
- Change in educational attainment
- Cross-state migration
- Attrition from the licensed RN population (e.g., due to career changes, retirement, death and disability)
- RN labor force participation rates

# Nursing Supply Model Overview



# Three Measures of RN Supply Projected

- RN population: the number of licensed RNs
- Active RNs: the number of RNs employed in nursing or seeking employment in nursing
- FTE supply: the number of full-time-equivalent (FTE) RNs employed in nursing

# NSM Primary Data Sources

- Sample Survey of RNs (1992, 1996, 2000)
  - To estimate base year RN population by age, education level and State
  - To estimate labor force activity rates by RN age and education level
  - To estimate cross-state migration patterns
- Current Population Survey (1999-2001)
  - To estimate RN retirement and disability rates
- Census Bureau population projections 2000 to 2020
  - To estimate changes in the size of the female population age 20-44, the traditional candidate pool for RNs

# NSM Limitations

- Parts of the NSM are static
  - Retirement, education upgrades, and labor force participation patterns constant across States and over time, but differ by RN age and education level
  - Cross-state migration patterns constant over time, but vary by State and RN age and education level
  - NSM user can change assumptions regarding key variables
- RN supply projections are independent of
  - RN demand projections
  - Projected supply of other health workers (e.g., LPNs)
- Small sample size in some surveys (e.g., RN Survey) reduces reliability of projections for smaller States

# Nursing Demand Model Overview

Nurse Demand is defined as the number of full time equivalent (FTE) nurses that society is willing to pay for given population needs, economic considerations, the healthcare operating environment, and other factors.

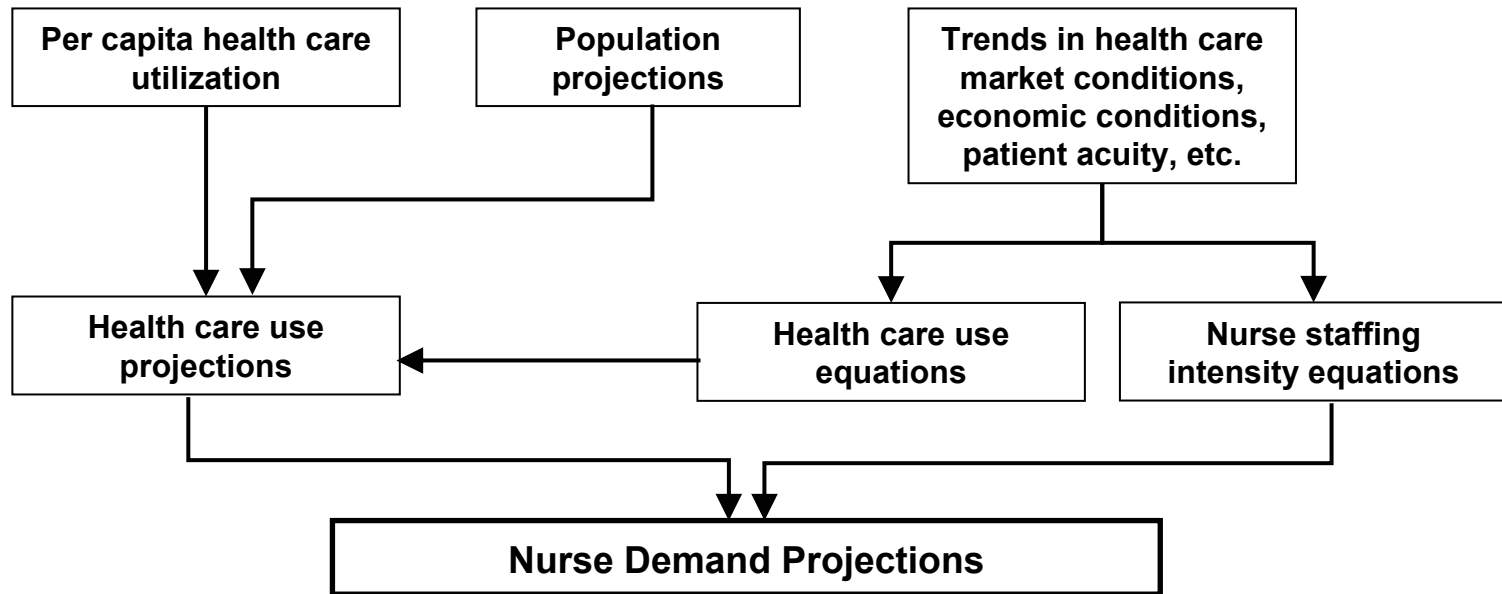
# NDM Projection Dimensions

- 12 settings (e.g., hospitals, nursing homes, home health, doctors offices, public health)
- 50 States plus the District of Columbia
- Years 2000 to 2020
- RNs, LPNs, nurse aides, home health aides

# NDM Projection Approach

- Regression analysis of healthcare utilization and RN staffing
- Determinants include:
  - Demographics and geographic location of population
  - Economic factors—e.g.,
    - Nurse wages (e.g., ratio of RN to LPN hourly wages)
    - Medicare and Medicaid reimbursement rates
    - Per capita personal income
  - Characteristics of the health care system—e.g.,
    - Shift from hospital inpatient to outpatient services
    - Percent uninsured
    - HMO saturation rate

# Nursing Demand Model Overview



# NDM Primary Data Sources for RNs

- Nurse demand (data for 1996 to 2000)
  - Sample Survey of RNs: estimates of RNs by employment setting
  - American Health Care Association: estimates of FTE RNs employed in nursing facilities
- Health care demand (data for 1996 to 2000)
  - Area Resource File
  - National Inpatient Sample
  - National Ambulatory Care Survey
  - National Hospital Ambulatory Care Survey
  - National Nursing Home Survey
  - National Home and Hospice Care Survey
- Population projections: Census Bureau (data for 1996 to 2020)

# NDM Limitations

- Simplified model of a complex health care system
  - Contains limited number of demand determinants
  - Has limited ability to model effect of economic determinants on substitution of nurse types
  - Technology is static
- State-level data used to estimate relationships that occur at the local level
- Small sample size in some surveys (e.g., RN Survey) reduces reliability of projections for smaller States and settings that employ fewer nurses

# Adequacy of Future RN Supply

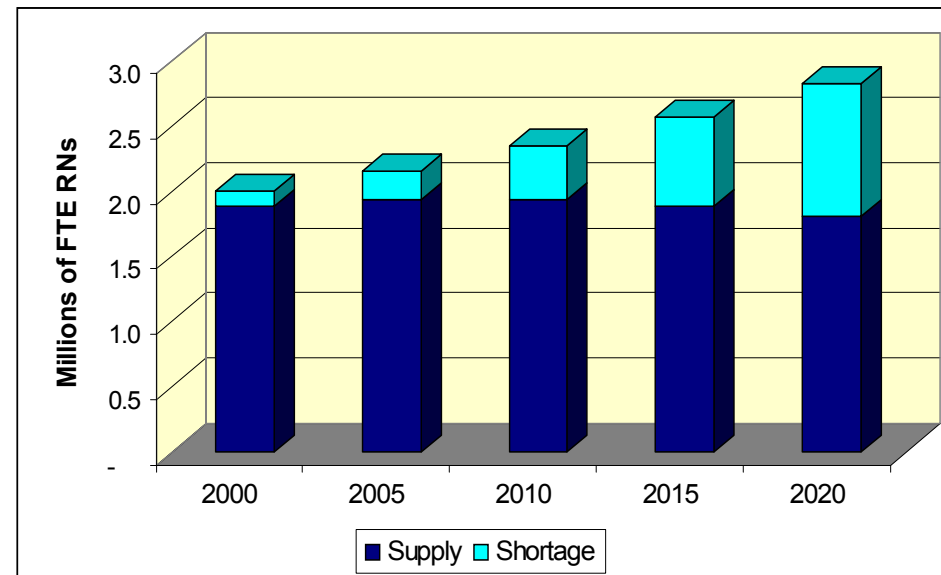
# Define “Shortage”

***“Labor shortages are sometimes characterized by a tendency to define a shortage in terms that are independent of demand. According to our definition a shortage exists if, at the prevailing wage rate for a given occupation, demand exceeds supply. Frequently, however, actual demand is ignored and a shortage is defined with reference to what someone thinks society ‘needs.’”***

Ehrenberg and Smith

# Baseline Supply and Demand Projections Suggest Growing National Shortage

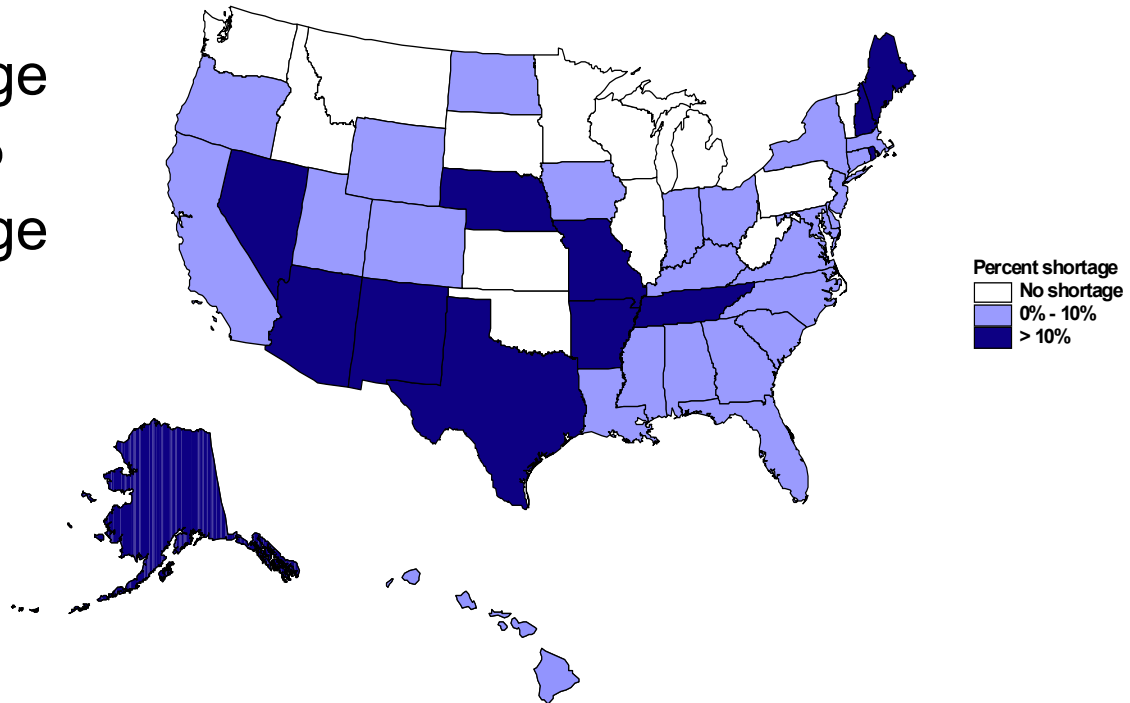
- Estimated shortage of approximately 100,000 FTE RNs in 2000
- Projected shortage of 400,000 FTE RNs by 2010
- Projected shortage of 1,000,000 FTE RNs by 2020



# Between 2000 and 2020, State-wide Shortages of RNs Will Increase

- In 2000, estimated
  - 25 States with shortage between 0% and 10%
  - 13 States with shortage >10%
- By 2020, all States projected to have shortage > 10%

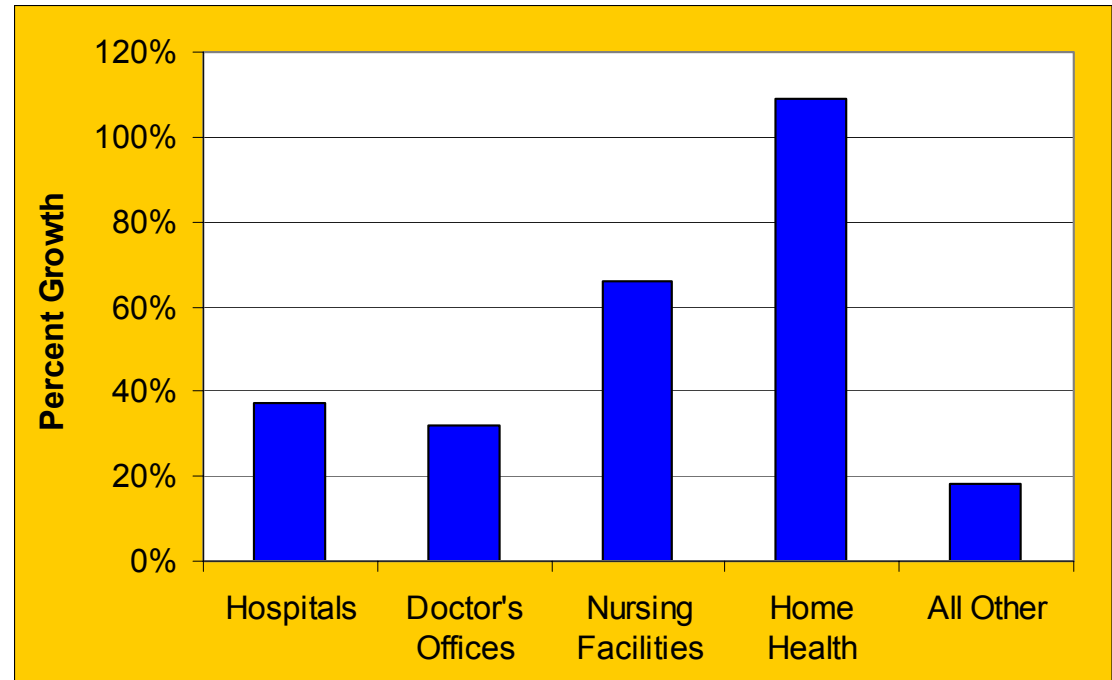
States with Estimated Shortage in 2000



# Projected Growth in RN Demand Varies by Setting

- Between 2000 and 2020, FTE RN demand projected to increase
  - 41% in total
  - 37% in hospitals
  - 32% in doctors' offices
  - 66% in nursing facilities
  - 109% in home health
  - 18% in all other settings

Projected Growth in Demand for  
FTE RNs: 2000 to 2020

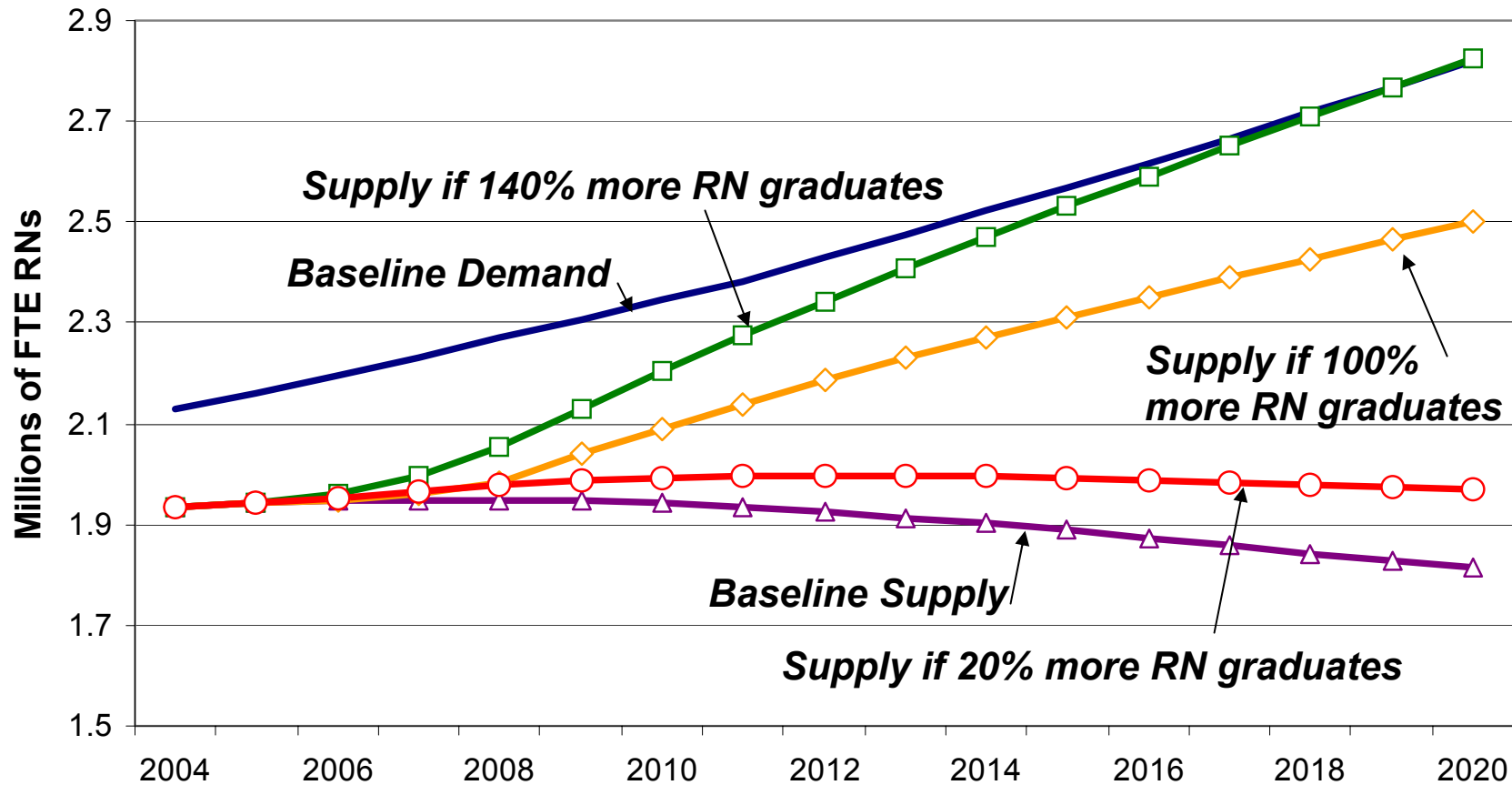


# Alternative Supply and Demand Scenarios

# Alternative Supply Scenarios

- Scenario #1: Increase graduates of U.S. nursing programs
- Scenario #2: Increase RN wages relative to wages in alternative occupations
- Scenario #3: Improve retention in nursing though delayed retirement
- Scenario #4: Improve working conditions to attract and retain RNs—additional research needed before this scenario can be modeled

# Supply Scenario #1: Increase Graduates of U.S. Nursing Programs



# Supply Scenario #1—Results

To meet projected growth in RN demand, the U.S. needs to more than double the number of RNs graduating from U.S. nursing programs

# Scenario #2: Increase RN Wages Relative to Alternative Occupations

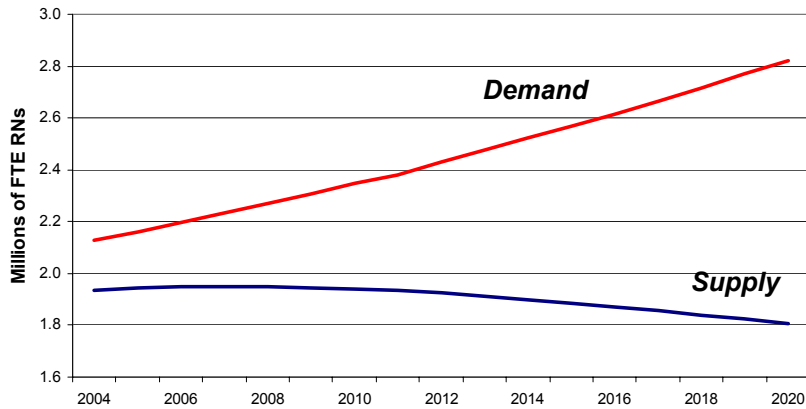
- Supply assumptions
  - Short-term pay elasticity
    - Reflects relationship between pay and FTE activity rate
    - Assumes each 1% real increase in RN wages increases FTE activity rates by 0.3%
  - Long-term pay elasticity
    - Includes short-term pay elasticity effects
    - Also reflects relationship between pay and number of new entrants to nursing profession
    - Assumes each 1% real increase in RN wages increases the number of new RN graduates by 0.8% (assumes no training capacity constraints)

# Scenario #2: Increase RN Wages Relative to Alternative Occupations

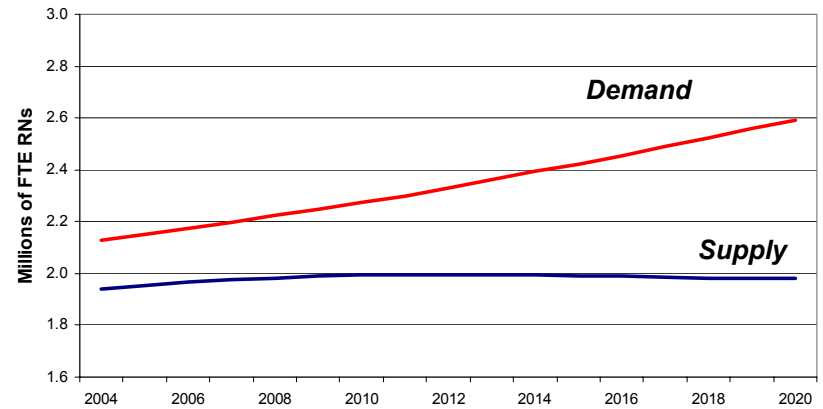
- Demand assumptions
  - Higher RN wages result in some substitution of LPNs (and other health workers) for RNs, the rate of substitution differs by employment setting
- Scenario
  - RN wages increase by 1%, 2%, 3% annually starting in 2004
  - By 2020, the cumulative effect results in wages increases of 17%, 37% and 60%, respectively
  - This is real growth in addition to increases in cost of living and wages paid in occupations that compete for RNs

# Scenario #2: Increase RN Wages Relative to Alternative Occupations

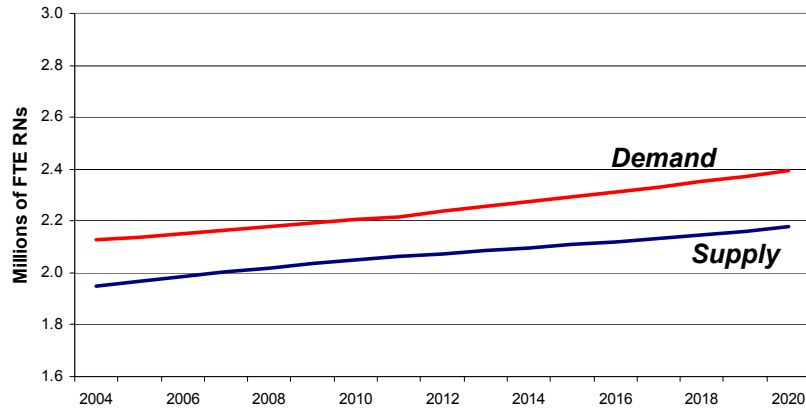
**0% Growth (Baseline)**



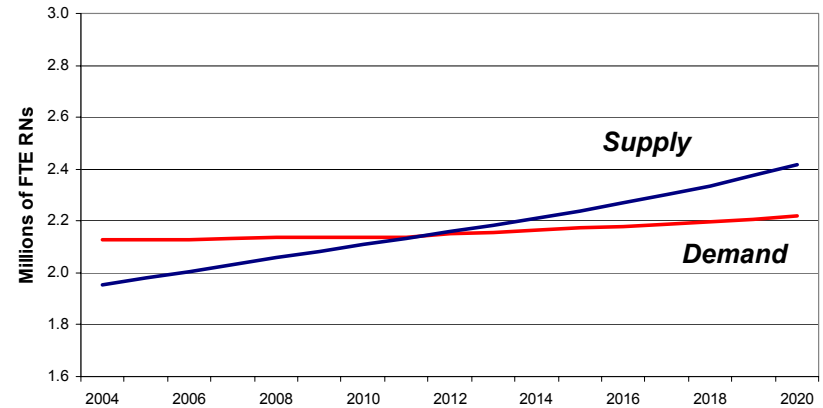
**1% Annual Growth**



**2% Annual Growth**



**3% Annual Growth**

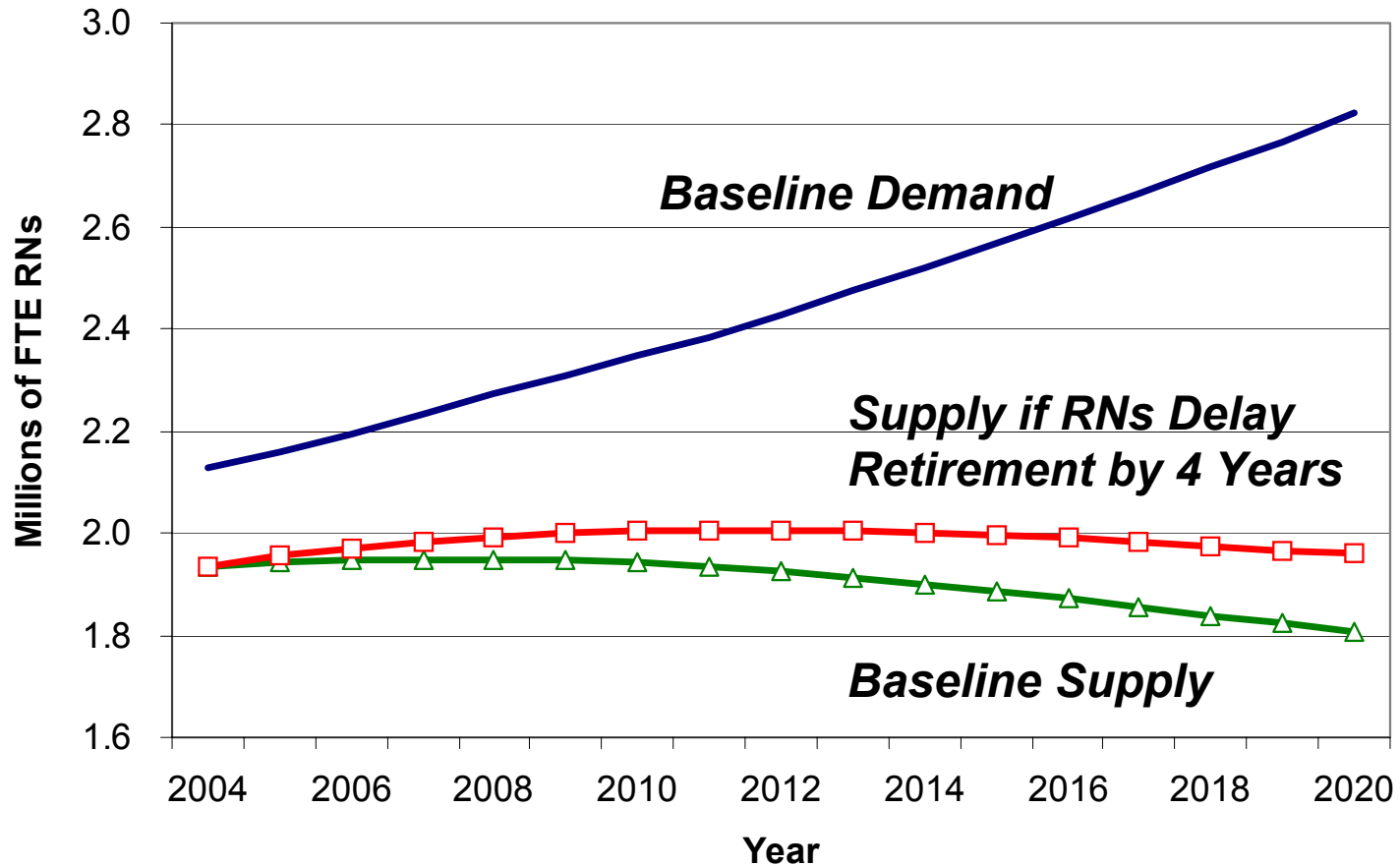


# Supply Scenario #2—Results

If compensation alone were used to eliminate the shortage, RN wages would need to increase between 2% and 3% annually, over a period of 8+ years (above any increases paid for other occupations)

- 3% annual growth through 2012 = cumulative growth of 27%

# Scenario #3: Delayed Retirement



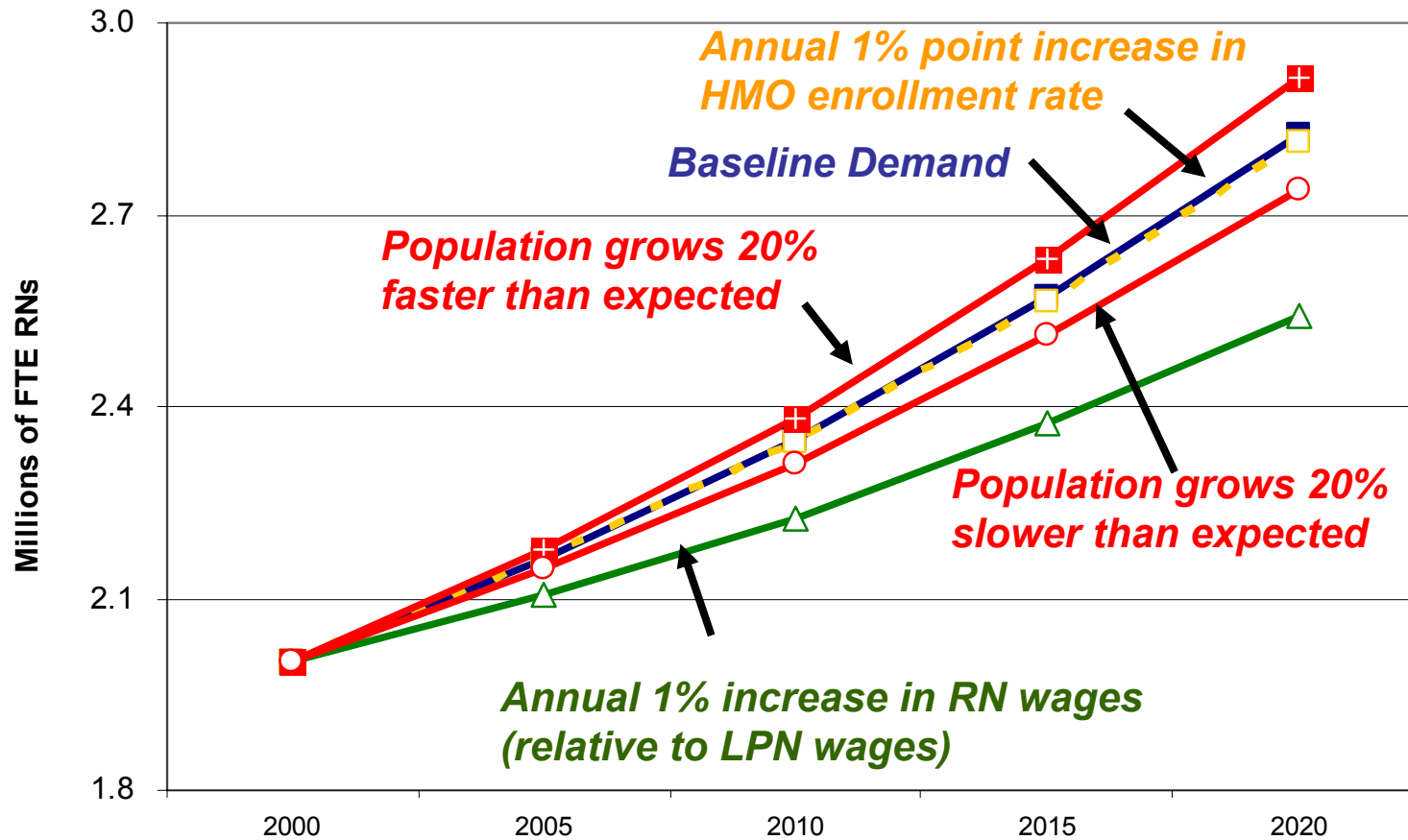
# Supply Scenario #3—Results

Delaying retirement by an average of 4 years would increase the supply of FTE RNs by nearly 150,000 (8%) in 2020 (relative to baseline projections), but shortage persists

# Alternative Demand Scenarios

- Scenario #1: 1% annual increase in HMO saturation rates
- Scenario #2: 1% annual increase in RN to LPN relative wages
- Scenario #3: Population grows 20% faster than projected by Census Bureau
- Scenario #4: Population grows 20% slower than projected by Census Bureau

# Projected Demand for RNs Under Alternative Scenarios



# Demand Scenario—Results in 2020 Relative to Baseline Projections

- Scenario #1—Virtually no change in RN demand
- Scenario #2—10% decrease in RN demand
- Scenario #3—88,000 more RNs needed
- Scenario #4—85,000 fewer RNs needed

# Implications and Additional Research

# Implications of Findings

- A growing and aging population will dramatically increase demand for nursing services
- The RN workforce is aging with a significant number of RNs nearing traditional retirement age
- Ensuring an adequate supply of RNs will require a combination of training more RNs, improving compensation, and improving working conditions

# Additional Research to Support Models

- Estimate relationship between new RN graduates and
  - Wages
  - Working conditions
  - Teaching capacity
  - Training costs
- Estimate relationship between RN employment activity status and
  - Wages
  - Working conditions
- Model demand by skill/training