The Supply and Demand of Physician Assistants and Nurse Practitioners in the US

Roderick S. Hooker
Department of Veterans Affairs
University of Texas
Southwestern Medical Center

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Healthcare Workforce
Issues of the 21st Century

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Problem: “Missing in Action”

- Continued debate about physician workforce supply and demand
- Feeble attempts to add the PA/NP supply & demand to medical workforce projections (40 years)
  - Largely a hidden workforce
  - PAs & NPs reduce shortages (Grumbach, others)
- Reasons to include PA/NPs in the equation:
  - Education time: 24-30 months
  - Education costs: ~$1,000/month per student
  - Task transfer >87% of all primary care - safely
  - 4th most satisfying career in America (>10 studies)
  - Career trajectory >30 years
Question

Will the projected supply of PA/NPs in the US be sufficient to meet the projected medical demand by 2020?
Approach to the Question

- Describe the current status of the PA/NP professions.
- Delineate a demand model (GDP and US population estimates).
- Improve the supply model (PA/NP pool, new entrants and annulments).
- Create alternative scenarios:
  - status quo
  - 10% increase
  - 25% increase
Data Sources

- American Academy of Physician Assistants (AAPA) Census Data
- American Association of Colleges of Nursing
- American Academy of Nurse Practitioners (AANP)
- US Census Bureau
- Bureau of Economic Analysis (BEA)
- Physician Assistant Education Association (PAEA)
- National Commission on the Certification of Physician Assistants (NCCPA)
- National Organization of Nurse Practitioner Faculties
Assumptions

- Supply Side
  - Retirement age (67)
  - Attrition from education programs (7%)
  - NCCPA certification pass rate (95%)
"Just as there are no little people or unimportant lives, there is no insignificant work."

- Elena Bonner
Physician Workforce Studies

- Flexner (1910)
- Bane (1959)
- GMENAC (1981)
- COGME (1994)
- Weiner (1994)
- Cooper (1995, 2001)
- COGME (2005)
Workforce Forecasting Approaches

Methodologies
- Needs-based
- Utilization-based
- Benchmarking
- Econometric (trend)

Characteristics
- Substantial data needs
- “Best Practices”
- Macroanalytic approach
The Cooper Trend Model
(Occam’s Razor)

SUPPLY × SUFFICIENCY × TRENDS × CONSTRAINTS

- Utilization of Providers
- Adequacy of Services
- Production
- Substitution
- Attrition
- Economy
- Population
- Training
- Fiscal

SUPPLY × DEMAND
Sufficiency

- Utilization of PAs and NPs
  - Perry and Breitner (1982)
  - Riportella-Muller, Libby, & Kindig (1995)
  - Dial, Palsbo, Bergsten, Gabel, & Weiner (1995)
  - Anderson and Hampton (1999)
  - Hooker (2006)

- Trends
  - Cooper (2001)
  - Hooker and Berlin (2002)
Trends

- US Economic Trends
- US Population Trends
Trends: PAs and NPs

- **Productivity Trends**
  - Congressional Budget Office Report (1979)
  - Record (1981)
  - OTA (1986)
  - Hooker (2002)

- **Attrition Trends**
  - American Academy of Family Physicians

Wishful thinking?
US PA and NP Graduates Per Year (1992-2007)
## Decennial Growth of US PAs, NPs [Residents & Fellows] (1970-2110)

<table>
<thead>
<tr>
<th>Year</th>
<th>PAs</th>
<th>NPs</th>
<th>Residents &amp; Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>237</td>
<td>11,032</td>
<td>237</td>
</tr>
<tr>
<td>1980</td>
<td>23,409</td>
<td>45,865</td>
<td>23,409</td>
</tr>
<tr>
<td>1990</td>
<td>45,865</td>
<td>75,000</td>
<td>45,865</td>
</tr>
<tr>
<td>2000</td>
<td>75,000</td>
<td>67,882</td>
<td>75,000</td>
</tr>
<tr>
<td>2010 (est)</td>
<td>90,000</td>
<td>51,228</td>
<td>92,080</td>
</tr>
<tr>
<td>2110 (est)</td>
<td>95,725</td>
<td>62,042</td>
<td>90,000</td>
</tr>
</tbody>
</table>

### Notes:
- The chart above illustrates the decennial growth of Physician Assistants (PAs), Nurse Practitioners (NPs), and Residents & Fellows in the US from 1970 to 2110 (estimated).
- The data shows a significant increase in the number of practitioners, with the trend expected to continue into the future.

### Graph:
- The graph uses a bar chart to display the number of individuals in different categories for various years.
- Each category (PAs, NPs, Residents & Fellows) is represented by different colored bars.
- The x-axis represents the year, ranging from 1970 to 2110 (estimated).
- The y-axis represents the number of individuals, with a scale from 0 to 100,000.

### Key Observations:
- There is a notable increase in the number of PAs, NPs, and Residents & Fellows over the decades, with a significant jump from 1970 to 1980 and a steady growth thereafter.
- The data suggests a robust growth in the healthcare professions, indicating increased demand and availability of these roles.

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**Source:** American Association of Physician Assistants (AAPA) and American Nurses Association (ANA) data.
Constraints

- **PA Training Factors**
  - 134 active PA Programs
  - 40 graduates/program annually
  - 2006 graduates: 5,200
  - Attrition rate = 6.2%, 25 year avg = 7.5%

- **NP Training Factors**
  - 334 NP Programs
  - 20 graduates/program annually
  - 2006 graduates: 6,500

- **Fiscal**
  - Program funding sources
  - Reimbursement for PA/NP services
Comparison of household and provider surveys

<table>
<thead>
<tr>
<th>Survey Component nickname</th>
<th>NAMCS (OBV)</th>
<th>NHAMCS-OPD</th>
<th>NHAMCS-ED</th>
<th>MEPS-OBV</th>
<th>MEPS-OPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey Component Full name</td>
<td>National Ambulatory Medical Care Survey</td>
<td>National Hospital Ambulatory Medical Care Survey - hospital outpatient department</td>
<td>National Hospital Ambulatory Medical Care Survey - hospital emergency department</td>
<td>Medical Expenditure Panel Survey - Office Based provider Visits</td>
<td>Medical Expenditure Panel Survey, Hospital outpatient department visits</td>
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<td>Primary sponsor</td>
<td>National Center for Health Statistics</td>
<td>Agency for Healthcare Research and Quality</td>
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<td></td>
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</tr>
<tr>
<td>Data source</td>
<td>Providers</td>
<td>Households</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>Office-based</td>
<td>Hospital outpatient department</td>
<td>Hospital emergency department</td>
<td>Office-based</td>
<td>Hospital outpatient department</td>
</tr>
</tbody>
</table>
Percent of PAs and NPs (Under)represented in National Outpatient Surveys

What Proportion of Patient Visits Should We Expect to be Attended by NP/PAs?

- Physician: PA ratio 10:1
- Assume that PAs see about 85% as many patients/week as physicians (75-110%)
- Prediction: PAs = 7% of all patient visits
- Databases = Physician:PA visit ratio 14:1
Projected Increases to 2020

Physician Requirements

Baseline
- Economic Growth offset by productivity increase
- Growing Role of NPCs
- Economic Growth
- Physician productivity increase

HRSA 2006
Dahl T, Grover A
Objective One: Profession Status

- NP Census Data:
  - Gender
  - Specialty
  - Practice Setting
Objective Two: Demand Model

- **Variables:** NP, PA, GDP, US Population

**Model Selection**

- Autoregressive data
- Dynamic regression (transfer function)
  
  - The Dynamic regression model is similar to regression analysis, but it is believed to produce more realistic results because it emphasizes the ripple effects the input variables can have on the dependent variable.
  - For example, a price change made today might effect sales volumes in a variety of ways for many periods in the future.
Objective Three: Supply Model

- Baseline:
  - Certified PAs 2006: 59,629
  - Clinically-active NPs 2006: 65,000
  - (age 22-67)

- New entrants
  - Program capacity
    - PA: 5,700
    - NP: 7,000
  - Attrition (non-graduation rate): 7%
  - Certification Exam Pass Rate: 95%

- Annual Annulments
  - Death
  - Retirement
Objective Four: Scenario Building

- **Status quo**
  - No growth in NP/PA capacity
  - Stability in demographics

- 10% increase
  - Growth in PAs
  - No growth NPs

- 25% increase
  - Growth PAs
  - Growth NPs
"Prediction is very difficult, especially about the future."

- Niels Bohr
PA Practice in the US

Practice Setting

Specialization Trends

[Diagram showing practice setting trends from 1999 to 2006 with categories such as Single Specialty, Solo Physician Practice, Multi Specialty, Hospital, any type, Community Health Clinic, HMO, and All Others.

Diagram showing specialization trends from 1996 to 2006 with categories such as Primary Care, General Surgery, Internal Medicine Subspecialties, Emergency Medicine, and Other.]
PA Practice in the US

- Diversity

- Feminization
Supply Model Delineation (2007)

- Base: 59,629 certified PAs
- Deleted > 67 years old
- New entrants per annum
  - 5,707 graduates (or 10% = 6277, 25% = 7134)
  - Adjusted by assumed attrition rate (7%)
  - Age & gender derived from PAEA data
- Pool ages across forecasts with >67 y/o deleted
Status Quo Scenario

- GDP & U.S.
- Population
- Model
- Lower 95% C
- Upper 95% C

# of PAs

- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
25% Increase Scenario

GDP & U.S. Population Mode

Lower 95% CI

Upper 95% CI

25% Increase

# of PAs

2000-2020 Growth
Primary/Non-Primary Care

Total Patient Care
Primary Care
Nonprimary Care

HRSA 2006
Dahl T, Grover A
Implications

"The highest reward for a person's toil is not what they get for it, but what they become by it."

- John Ruskin
US Medical Workforce Composition

- Department of Health and Human Services
- Bureau of Health Statistics
- Specialization trend
- Diversity trends
- Additional (unknown) influences
NP/PA Educational Institution Challenges

- Faculty recruitment and retention
- Clinical training sites
- Diversity
- Financial support
Limitations

- Lack of inclusion of NP/PAs in national surveys obviates a critical variable
- Insufficient data on lifestyle changes
- Productivity of PAs and NPs in specialty settings needs to be delineated
- Other predictors of demand
  - Sustainability of diseases
  - 1/3 of all baby girls will live to 100
  - Technology
Questions?

"Whosoever uses the crystal ball must be prepared to eat ground glass."

- Romanian gypsy proverb
## Precision of 2003 National Estimates

<table>
<thead>
<tr>
<th></th>
<th>NAMCS office-based</th>
<th>NHAMCS hospital outpatient department</th>
<th>NHAMCS emergency department</th>
<th>MEPS office-based</th>
<th>MEPS hospital outpatient department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physician visits (millions)</strong></td>
<td>864 (777-953)</td>
<td>75.1 (61.3-88.8)</td>
<td>105.2 (94-115)</td>
<td>970.4 (925-1016)</td>
<td>54.9 (48.5-61.4)</td>
</tr>
<tr>
<td><strong>PA visits in millions (95% CL)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With physician</td>
<td>12.9 (6.6-19.2)</td>
<td>6.9 (2.3-11.5)</td>
<td>7.5 (5.4-9.4)</td>
<td>12.7 (10.6-14.8)</td>
<td>0.56 (.26-.86)</td>
</tr>
<tr>
<td>Without physician</td>
<td>6.4 (3.0-9.8)</td>
<td>0.6 (0.2-0.9)</td>
<td>3.9 (2.6-5.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.5 (2.0-11)</td>
<td>6.3 (1.7-10.9)</td>
<td>3.6 (2.0-5.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% visits to</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians</td>
<td>98.5</td>
<td>91.6</td>
<td>93.3</td>
<td>98.7</td>
<td>99</td>
</tr>
<tr>
<td>PAs</td>
<td>1.5</td>
<td>8.4</td>
<td>6.7</td>
<td>1.3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Visit ratio</strong></td>
<td>67:1 (43:1,146:1)</td>
<td>12:1 (6:1, 41:1)</td>
<td>14:1 (8:1, 47:1)</td>
<td>76:1 (49:1,165:1)</td>
<td>98:1 (27:1,?)</td>
</tr>
</tbody>
</table>

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*a. % visits calculations reflect only visits to PAs and physicians. Visits to other providers are excluded*