

Comparison of characteristics of office-based visits to physician assistants and physicians, 1996- 2003

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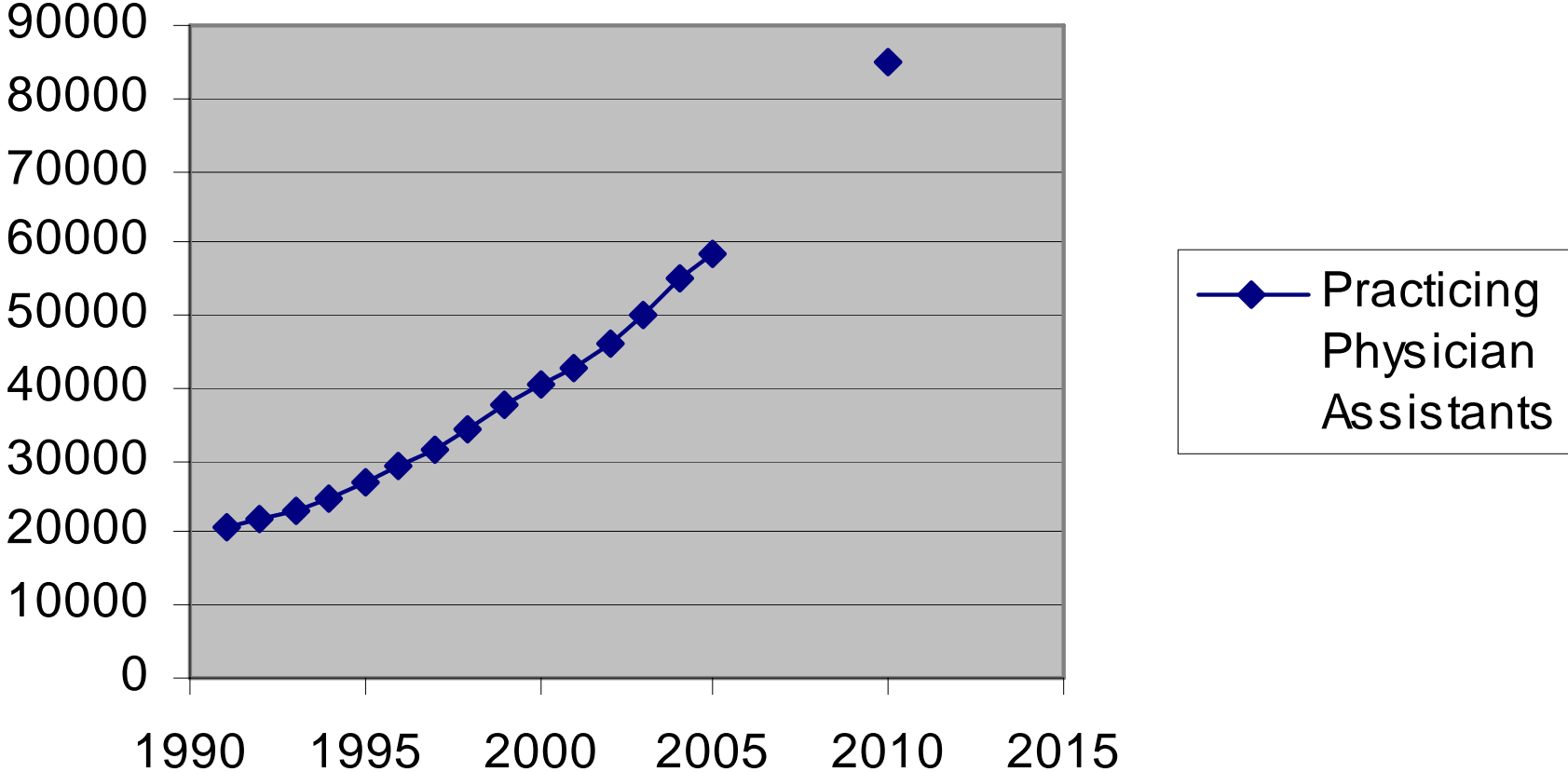
Definition: Physician Assistants

- Health care professionals licensed to practice medicine with physician supervision
- Within the physician-PA relationship, physician assistants exercise autonomy in medical decision making and provide a broad range of diagnostic and therapeutic services.

Why are PAs important?

- PAs are a significant and growing portion of the health workforce.
 - Bureau of Labor Statistics ranks PA as the fourth fastest growing occupation
 - Ratio of patient care physicians:PAs is about 10:1
 - Ratio of USMG:PAs entering workforce is 4.2:1
- PAs provide medical services that overlap those provided by physicians.
- PAs embody the team approach and complement physician practice

Practicing Physician Assistants



Data from American Academy of Physician Assistants (AAPA).

Why is this research important?

- Physician assistants (PAs) and nurse practitioners (NPs) might buffer a potential physician shortage and reduce the number of additional physicians needed.
- The large growth in PA and NP numbers is inadequately taken into account in medical workforce planning.

COGME 16th Report, 2005

- Predicts by 2020
 - a shortfall of 85,000 physicians
 - a potential increase of 150,000 PAs, NPs, and CNMs
- Does not assess the possible impact of the 150,000 PAs/NPs/CNMs on the shortage of 85,000 physicians.
- Why this disconnect?

Why are PAs and NPs a potential partial solution?

- Time
 - Pipeline is 2.2 years for PAs vs. 7+ years for physicians
- Cost
 - Median PA salary: \$77,400¹
 - Mean NP salary: \$74,812 ²
 - Median family medicine physician salary: \$156,000³
 - Training costs are much lower for PAs/NPs than for MDs
- Quality
 - The bulk of research indicates that quality of care is maintained when PAs and NPs provide care.

¹ AAPA Census, 2005.

² Advance for nurse practitioners, <http://nurse-practitioners.advanceweb.com/common/editorial/editorial.aspx?CC=65135> 2005.

³ Bureau of Labor Statistics, 2006. Excludes physicians with less than one year experience.

Research questions

1. How do *patients* seen by PAs and physicians compare with regard to demographic, geographic, socioeconomic, insurance status, and health status?
2. How do *patient visits* to PAs or physicians compare with regard to diagnosis, type of visit, use of laboratory tests and prescription medications?
3. What are the *trends* in these characteristics between 1996 and 2003?

Medical Expenditure Panel Survey (MEPS)

- AHRQ household survey
- Representative of civilian non-institutionalized U.S. population
- Data available from 1996-2003
- This project uses data from the office-based care component.

MEPS strengths/weaknesses for this analysis

- Strengths:
 - Large size
 - Many interesting variables
- Weaknesses:
 - Does not include category for nurse practitioners/advanced practice nurses
 - Provider type identification error.
 - Only includes data about PA visits if a physician was *not* seen.

MEPS visits to physicians and PAs by year (unadjusted)

Year	# Physician visits	# PA visits	Physician:PA visit ratio
1996	70671	473	150:1
1997	104428	766	137:1
1998	73137	570	129:1
1999	72315	504	144:1
2000	74772	472	159:1
2001	105156	1015	105:1
2002	121548	1598	77:1
2003	103581	1236	85:1
Total	725608	6634	110:1

MEPS under-represents PA care.

Prevailing ideas about PA patient care activities

- PAs see the least complex patients
 - Younger, healthier, with straightforward problems
- PAs provide a disproportionate portion of care to underserved populations
 - Especially in rural areas

Trends in PA care

- There has been speculation (and some evidence) that PA practice is becoming more similar to physician practice.
- What is the evidence from MEPS?

Comparison of patients seen by PAs and physicians, 1996-2003, adjusted

	PA	Physician	P value
Demographics			
Mean age (years)	41	45	<.0001
Female (%)	66	60	<.0001
Race/ethnicity			<.0001
White (%)	87	80	
Black (%)	4	9	
Hispanic (%)	5	9	
Other (%)	4	3	

Comparison of patients seen by PAs and physicians, 1996-2003, adjusted

Geographic	PA	Physician	P value
Rural^a (%)	35	19	<.0001
Region (%)			<.0001
Northeast	18	21	
Midwest	27	23	
South	32	35	
West	23	21	

^a.Office of Management and Budget metropolitan statistical area (MSA) definition

Comparison of patients seen by PAs and physicians, 1996-2003, adjusted

Socioeconomic variables	PA	Physician	P value
Poverty category			<.0001
Poor (%)	9	12	
Near poor (%)	4	4	
Low income (%)	12	14	
Mid income (%)	36	31	
Hi income (%)	40	39	
Mean person-level income (\$)	22411	21541	>.05 (ns)
Education			<.0001
< high school	13	20	
high school grad	33	33	
at least some college	54	47	

Comparison of patients seen by PAs and physicians, 1996-2003, adjusted

	PA	Physician	P value
Health insurance status			<.0001
Private insurance (%)	81	74	
Public insurance (%)	15	21	
Uninsured (%)	5	5	
Managed care (%)	49	45	<.0001
Health status			
Mean self-rated physical health (1=excellent, 5=poor)	2.4	2.6	<.05
Mean self-rated mental health (1=excellent, 5=poor)	2.0	2.2	<.05
% with any limitations	32	40	<.0001
Mean number of chronic/severe conditions	1.5	1.9	<.05

Comparison of other self-rated health measures among patients seen by PAs and physicians, 2000-03, adjusted

	PA	PHYSICIAN	P VALUE	SCALE	Effect size (Cohen's d)
SF-12 ¹ PHYSICAL COMPONENT SCORE	45.9	43.0	<.05	1-75	.23
SF-12 MENTAL COMPONENT SCORE	49.9	48.8	<.05	1-75	.10
EUROQOL-5D ² SUMMARY SCORE	0.77	0.71	<.05	-0.6-1.0	.19
EUROQOL-5D SCALE SCORE	77.1	72.1	<.05	1-100	.23

¹ Ware JE, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. Med Care 1996; 34:220.

² Brooks R. EuroQol: the current state of play. Health Policy 1996; 37(1):53-72.

Most common visit diagnoses (clinical classification code)

PA

1. OTHER UPPER RESPIRATORY INFECTIONS
2. OTHER UPPER RESPIRATORY DISEASE
3. ESSENTIAL HYPERTENSION
4. OTHER SKIN DISORDERS
5. SPRAINS AND STRAINS
6. DIABETES MELLITUS WITHOUT COMPLICATIONS
7. OTITIS MEDIA AND RELATED CONDITIONS
8. CHRONIC OBSTRUCTIVE PULMONARY DISEASE
9. SPONDYLOSIS, INTERVERTEBRAL DISC DISEASE
10. URINARY TRACT INFECTIONS
11. VIRAL INFECTION
12. OTHER CONNECTIVE TISSUE DISEASE
13. ASTHMA
14. OTHER NON-TRAUMATIC JOINT DISORDERS
15. NORMAL PREGNANCY AND/OR DELIVERY
16. INTESTINAL INFECTION
17. OTHER MENTAL CONDITIONS
18. OTHER INJURIES AND CONDITIONS DUE TO ALLERGIC REACTIONS
19. OTHER NERVOUS SYSTEM DISORDERS
20. DISORDERS OF LIPID METABOLISM

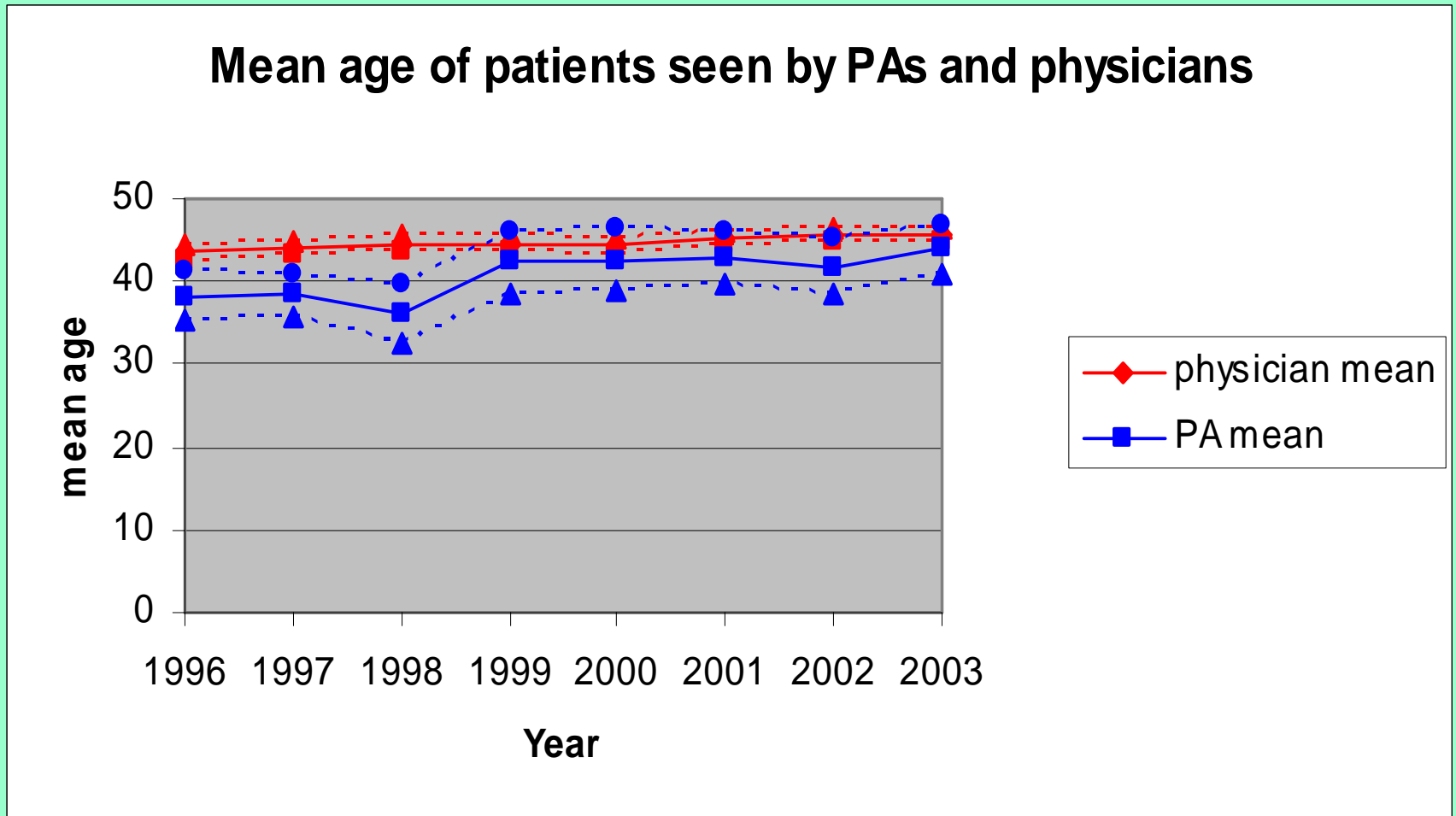
Physician

1. OTHER UPPER RESPIRATORY INFECTIONS
2. NORMAL PREGNANCY AND/OR DELIVERY
3. ESSENTIAL HYPERTENSION
4. SPONDYLOSIS, INTERVERTEBRAL DISC DISEASE
5. DIABETES MELLITUS WITHOUT COMPLICATIIONS
6. OTHER NON-TRAUMATIC JOINT DISORDERS
7. OTHER MENTAL CONDITIONS
8. OTHER SKIN DISORDERS
9. OTHER UPPER RESPIRATORY DISEASE
10. OTITIS MEDIA AND RELATED CONDITIONS
11. OTHER CONNECTIVE TISSUE DISEASE
12. OTHER INJURIES AND CONDITIONS DUE TO ALLERGIC REACTIONS
13. SPRAINS AND STRAINS
14. CHRONIC OBSTRUCTIVE PULMONARY DISEAS
15. OTHER NERVOUS SYSTEM DISORDERS
16. ASTHMA
17. ANXIETY, SOMATOFORM,DISSOCIATIVE, DISORDERS
18. VIRAL INFECTION
19. RESIDUAL CODES, UNCLASSIFIED
20. CATARACT

Trends:

- Are patients seen by PAs or physicians becoming more similar over time?
- Particularly interested in patient
 - Complexity
 - Underservice

Trend in mean patient age



Trends in differences of patients seen by PAs and physicians

- Differences disappeared for patient
 - Age
 - Level of education
- No trends in other variables

Summary: Patients who see PAs are

Measures of complexity

- Younger
- More female
- Have slightly better health status
- Have similar diagnoses

Measures of underservice

- More white
- More rural (a lot!)
- More midwestern and western
- Higher SES
- More likely privately insured
- More likely in an HMO

How do these traits interact?

Summary

- **COMPLEXITY:**
 - PAs see patients that are slightly less complex than those of physicians, but there is some evidence that these differences may be narrowing.
- **UNDERSERVICE:**
 - PAs provide disproportionate share of care to rural patients.
 - PAs are less likely to see other underserved groups. Some of these differences are explained by rural-urban differences.
 - Interactions among these variables require further study

Conclusions

- Workforce planning should include potential contributions of PAs.
- National surveys should modify data collection to better reflect PA contributions.
- PAs see patients that are similar in many ways to those seen by physicians.
- Analysis at patient care team level are needed to fully understand contributions of non-physician clinicians.

References

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5. National Center for Health Statistics. *Health, United States, 2005, With Chartbook on Trends in the Health of Americans*. Hyattsville, Maryland; 2005.
6. COGME. *Sixteenth Report: Physician Workforce Policy Guidelines for the United States, 2000-2020*. 2005. <http://www.cogme.gov/report16.htm#models> (March 22, 2006)
7. Agency for Healthcare Research and Quality. *Medical expenditure Panel Survey (MEPS), What is MEPS?* 2004, April 15, 2004. <http://www.meps.ahrq.gov/whatis.htm> (June 6, 2005)
8. Brooks R. EuroQol: the current state of play. *Health Policy* 1996; 37(1):53-72.
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The rest of the slides are only for
reference for the presenter

MEPS priority conditions

- Long-term, life-threatening conditions
 - Cancer
 - Diabetes
 - Emphysema
 - High cholesterol
 - HIV/AIDs
 - Hypertension
 - Ischemic Heart Disease
 - Stroke
- Chronic, manageable conditions
 - Arthritis
 - Asthma
 - Gall bladder disease
 - Stomach ulcers
- Mental Health Issues
 - Alzheimer's disease and other dementias
 - Depression and anxiety disorders

Theoretical basis

- Clinical perspective
- PA concept based on improving access to care for patients who are medically underserved (rural, poor, uninsured, racial/ethnic minority) and not complex
- Anderson's behavioral model used for categorization of variables
 - Modified by separating medical from personal characteristics

Table 1. Methods

	Part 1. PA Practice Trends: 1996-2002	Part 2. Risk Adjusted Quality of PA Care
Research question	What types of patients and patient problems are addressed by PAs in office-based care in the US? Has this changed between 1996-2002?	After accounting for case-mix, does <i>substantive</i> PA involvement in patient care affect patient satisfaction, quality of preventive services, health care utilization, and health expenditures?
Data source	MEPS 1996-2003 data	MEPS 2000-2003 data
Design	Cohort	Case-control
Level of analysis	Patient single encounter (visit) level	Person level, reflecting one year of an individual's health care experience.
Independent variables	Patient encounter attended by PA or MD (binary variable), Year of encounter	PA had substantive involvement in patient care vs. PA had no involvement in patient's care (binary variable)
Dependent variables	Medical diagnosis, chronic disease status. Patient demographics, SES, health status, health insurance status, and managed care participation	Patient satisfaction, preventive service provision, health care utilization, expenditures
Risk adjustment	None	Controls matched to cases using propensity scores based upon predisposing patient characteristics, enabling factors and need factors.
Type of statistical analysis	Logistic regression Linear regression Trend analysis	Logistic regression Linear regression

Other trends

Variable	Regression coefficient for year interaction	Significance	trend
Gender			No
Race			No
Rural-urban status (MSA)			No
Region			No
Education			yES
Poverty category			No
Health insurance status			No
Managed care status			No
Health status			P=.1 for self-rated health

Comparison of other self-rated health measures among patients seen by PAs and physicians, 2000-03, adjusted

	PA	PHYSICIAN	P VALUE	SCALE
SF-12¹ PCS (PHYSICAL COMPONENT SCORE)	45.9	43.0	<.05	1-75
SF-12 MCS (MENTAL COMPONENT SCORE)	49.9	48.8	<.05	1-75
EUROQUOL² SUMMARY SCORE	0.77	0.71	<.05	-0.6-1.0
EUROQUOL SCALE SCORE	77.1	72.1	<.05	1-100

¹Short form-12 item from Medical Outcomes Study

²Euroquol.....

Comparison of patient visits to PAs and physicians, adjusted

VISIT CHARACTERISTICS	PA	physician	P value
VISIT CATEGORY (%)			
GENERAL CHECKUP	18.90	23.21	
DIAGNOSIS OR TREATMENT	59.93	49.47	
EMERGENCY	1.81	0.83	
PSYCHOTHERAPY/MNTL HLTH COUNSELLING	0.33	3.79	
FOLLOW-UP OR POST-OP VISIT	9.42	11.17	
IMMUNIZATIONS OR SHOTS	3.85	1.51	
VISION EXAM	0.24	2.79	
MATERNITY CARE (PRE/POST)	1.53	3.31	
WELL CHILD EXAM	0.76	1.47	
LASER EYE SURGER	0.00	0.05	
OTHER	3.24	2.29	
VISITS RELATED TO A SPECIFIC CONDITION(%)	83.41	82.82	<.0001
VISITS WITH ANY MEDICATIONS PRESCRIBED (%)	45.21	35.01	<.0001
VISITS WITH ANY LAB TESTS ORDERED (%)	25.83	23.03	<.0001
MEAN VISIT EXPENDITURE (\$)	83.49	111.53	<.0001

Summary: Visits to PAs

- More likely for diagnosis and treatment
- More likely related to a specific condition
- For similar diagnoses as those to physicians
- Slightly more likely to involve a laboratory evaluation
- Much more likely to result in prescribed medications
- Lower expenditures

Why are medications prescribed more often for PA visits?

- Summarize the analysis I did that looked into this and failed to explain it.
- Describe limitations in the specificity of the data for this analysis
- Compare to previous research
- Probably don't have time to discuss this—delete?

Comparison of patients seen by PAs and physicians, adjusted

	PA	Physician	P value
Demographics			
Mean age (years)	41 (39.9-42.5)	45 (44.3-45.0)	<.05
Female (%)	66 (62.8-68.6)	60 (59.7-60.6)	<.0001
Race/ethnicity			<.0001
White (%)	87 (85.1-89.8)	80 (78.1-80.0)	
Black (%)	4 (3.0-4.9)	9 (8.6-9.7)	
Hispanic (%)	5 (3.6-5.9)	9 (8.1-9.2)	
Other (%)	4 (2.0-5.7)	3 (3.1-3.6)	

Comparison of patients seen by PAs and physicians, adjusted

Geographic	PA	Physician	P value
Rural^a (%)	35 (30.2-40.0)	19 (17.5-20.2)	<.0001
Region (%)			<.0001
Northeast	18 (13.2-23.1)	21 (19.5-22.9)	
Midwest	27 (22.2-31.0)	23 (21.0-24.3)	
South	32 (27.7-36.5)	35 (33.4-37.2)	
West	23 (19.6-26.8)	21 (19.3-22.5)	

^a.Office of Management and Budget metropolitan statistical area (MSA) definition

Comparison of patients seen by PAs and physicians, adjusted

Socioeconomic variables	PA	Physician	P value
Poverty category			<.0001
Poor (%)	9 (7.4-10.6)	12 (11.7-12.6)	
Near poor (%)	4 (2.6-4.6)	4 (4.1-4.6)	
Low income (%)	12 (10.0-13.4)	14 (13.1-14.0)	
Mid income (%)	36 (32.8-29.0)	31 (30.6-31.8)	
Hi income (%)	40 (36.9-42.8)	39 (38.1-39.6)	
Mean person-level income (\$)	22411	21541	>.05 (ns)
Education			<.0001
< high school	13 (10.8-15.0)	20 (19.7-20.9)	
high school grad	33 (29.7-35.3)	33 (32.1-33.3)	
at least some college	54 (51.6-57.4)	47 (43.7-45.5)	

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Mean age (years)	41 (39.9-42.5)	45 (44.3-45.0)	<.05
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Mid income (%)	36 (32.8-29.0)	31 (30.6-31.8)	
Hi income (%)	40 (36.9-42.8)	39 (38.1-39.6)	
Mean person-level income (\$)	22411 (21208-23614)	21541 (21201-21880)	>.05 (ns)
Education			<.0001
< high school	13 (10.8-15.0)	20 (19.7-20.9)	
high school grad	33 (29.7-35.3)	33 (32.1-33.3)	
at least some college	54 (51.6-57.4)	47 (43.7-45.5)	

Trends over time

Examined using regressions of the form:

$$\text{Age} = \text{PAV} + \text{year} + \text{PAV} * \text{year}$$

Where PAV is a binary variable indicating whether a PA or physician saw the patient

Interaction term (PAV*year) indicates linear trend in whether a patient saw a PA or physician.

$$\text{Age} = \text{PAV} + \text{year} + \text{PAV} * \text{year}$$

Estimated Regression Coefficients

Parameter	Estimate	Standard		
		Error	t Value	Pr > t
Intercept	43.34	0.4	109.56	<.0001
PAV	-6.76	1.4	-4.98	<.0001
YEAR	0.29	0.08	3.73	0.0002
PAV*YEAR	0.61	0.29	2.13	0.0332

Conclusions: patient visits

- Patient visits to PAs
 - More likely for Dx and Tx
 - Slightly more likely
 - to include laboratory evaluations
 - Be related to a specific condition
 - More likely to have a medication prescribed.

Conclusions: trends

- Age difference disappeared between 1996-2003.
- Education difference disappeared also

Conclusions: patient characteristics

In comparison to patients seen by physicians, patients seen by PAs are:

- Younger
- More female
- More white
- More rural
- More midwestern and western
- Higher SES
- More likely privately insured
- More likely in an HMO
- Healthier
- Have similar patient diagnoses

MEPS office-based visits to physicians and PAs by year (unadjusted)

Year	MEPS # Physician visits	MEPS US physician visit estimate (millions)	# PA visits	MEPS US PA visit estimate (Millions)	Physician:PA visit ratio (national estimates)
1996	70671		473	6.2	
1997	104428		766	7.0	
1998	73137		570	7.8	
1999	72315		504	6.7	
2000	74772		472	6.8	
2001	105156		1015	10.3	
2002	121548	977	1598	14	70:1
2003	103581	970	1236	12.7	76:1
Total	725608		6634		

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1996	70671	473	150:1			
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1999	72315	504	144:1			
2000	74772	472	159:1			
2001	105156	1015	105:1			
2002	121548	1598	77:1	977	14	70:1
2003	103581	1236	85:1	970.4	12.7	76:1
Total	725608	6634	110:1			

2003 national estimates

	NAMCS office-based	NHAMCS hospital outpatient department	NHAMCS emergency department	MEPS office-based	MEPS hospital outpatient department
Physician visits (millions)	864	75.1	105.2	970.4	54.9
PA visits in millions (95% CL)	12.9	6.9	7.5	12.7	0.56
With physician	6.4	0.6	3.9		
Without physician	6.5	6.3	3.6		
% visits to^a					
Physicians	98.5	91.6	93.3	98.7	99
PAs	1.5	8.4	6.7	1.3	1
Visit ratio Physician:PA	67:1	12:1	14:1	76:1	98:1

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