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**2010 ACG International
Risk Adjustment Conference**

MAY 10-12
Tucson, Arizona
Loews Ventana Canyon

A Comparison of Physician and Non-Physician Case-Mix in Community-based VA Clinics Using Adjusted Clinical Groups

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Non-Physician Providers

- **Nurse Practitioners**
 - ❖ 135,000 practicing in the U.S*
- **Physician Assistants**
 - ❖ 73,500 clinically active in 2009**



* NP Facts accessed online at: <http://www.aanp.org/NR/rdonlyres/32B74504-2C8E-4603-8949-710A287E0B32/0/NPFacts2010.pdf>

** Hooker, Roderick S. Physician Assistants: Policy and Practice -3rd Ed. 2010



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“Medicine is increasingly moving in the direction of large group practice where physicians function more like salaried personnel...This will make the use of paramedical personnel more congenial and in fact essential for rendering efficient or even adequate service.”

-Leo Levy (1966)

L. Levy, "Factors Which Facilitate or Impede Transfer of Medical Functions from Physicians to Paramedical Personnel," Journal of Health and Human Behavior 7, no. 1 (Spring 1966): 50-54.

More Time or More Complexity?

- **More Time?**

- ❖ Performing “time-consuming technical chores”*

- **More Complexity?**

- ❖ Caring for less difficult patients



*Berg, RH (1966) More than a nurse, less than a doctor. Look 30. 58-61

Appointment Triage

- Practice of triage
 - ❖ Availability
 - Geographical Distribution
 - Specialization
 - ❖ Policy
 - Fast-Tracking
 - Appt. protocols
 - ❖ Experience of Provider
 - ❖ Patient Preference



Objective

- **Compare the case-mix of physicians and non-physicians by testing the following hypotheses:**
 - ❖ **H1: Physicians see more complex patients with a higher morbidity burden than non-physicians**
 - ❖ **H2: Physicians provide care to patients with a higher average cost than non-physicians when measured by procedure code and relative value weights.**



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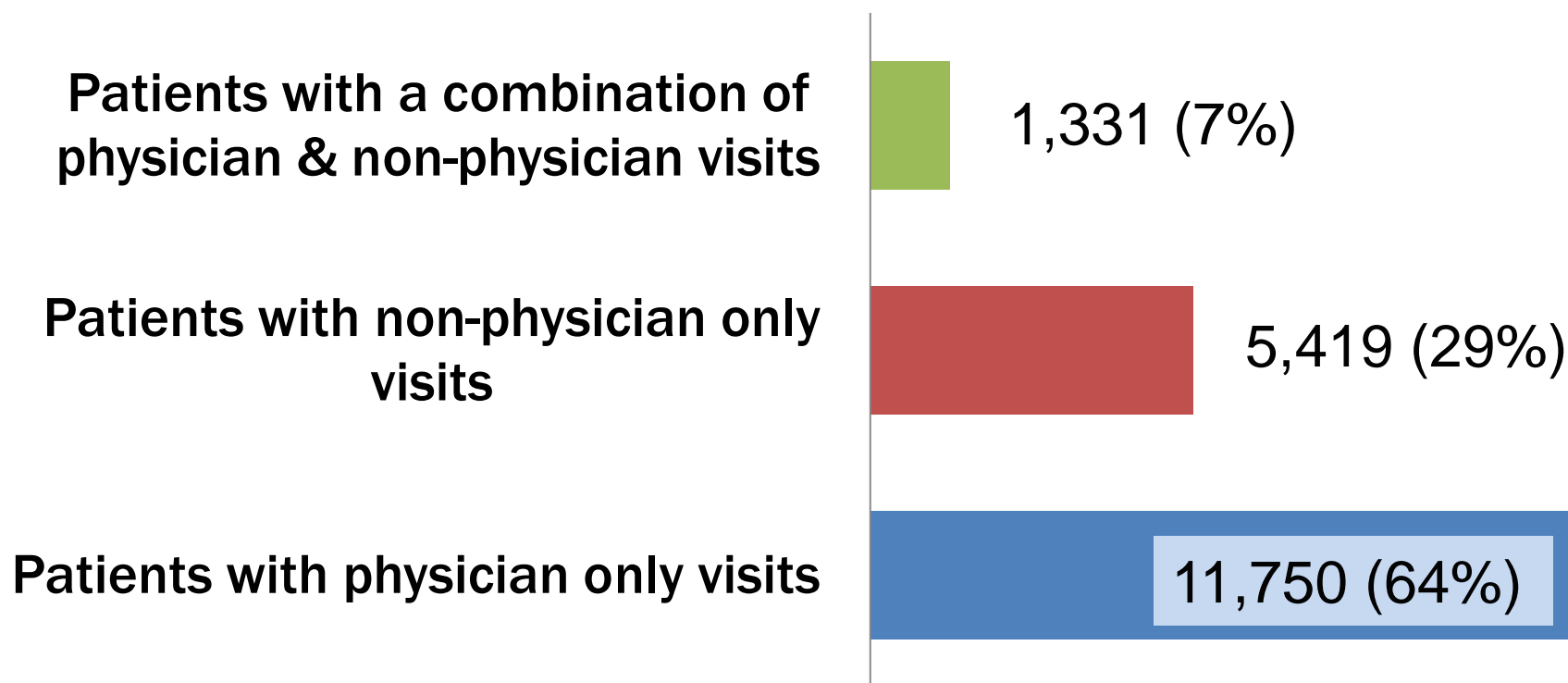
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Data Source

- VA community-based outpatient clinics (CBOCs) from non-coastal regions of the U.S. in fiscal year 2006
- Eight clinics randomly selected
- Primary care data only
- 38,327 encounters representing 18,884 patients
- Complete data available for 18,500 patients

Frequency



Data Processed

- Age, gender, ICD-9 diagnosis codes, (CPT) service codes
- Johns Hopkins ACG[®] Case-Mix System assigned Adjusted Clinical Groups (ACG Code), and Adjusted Diagnostic Groups (ADG assignments)
- Patient morbidity categorized*
 - ❖ Low (<4 ADGs)
 - ❖ Moderate (4 to 8 ADGs)
 - ❖ High (>8 ADGs)

*B. Starfield, K. W. Lemke, R. Herbert, W. D. Pavlovich, and G. Anderson, "Comorbidity and the Use of Primary Care and Specialist Care in the Elderly," *Annals of Family Medicine* 3, no. 3 (May-June 2005): 215-222.

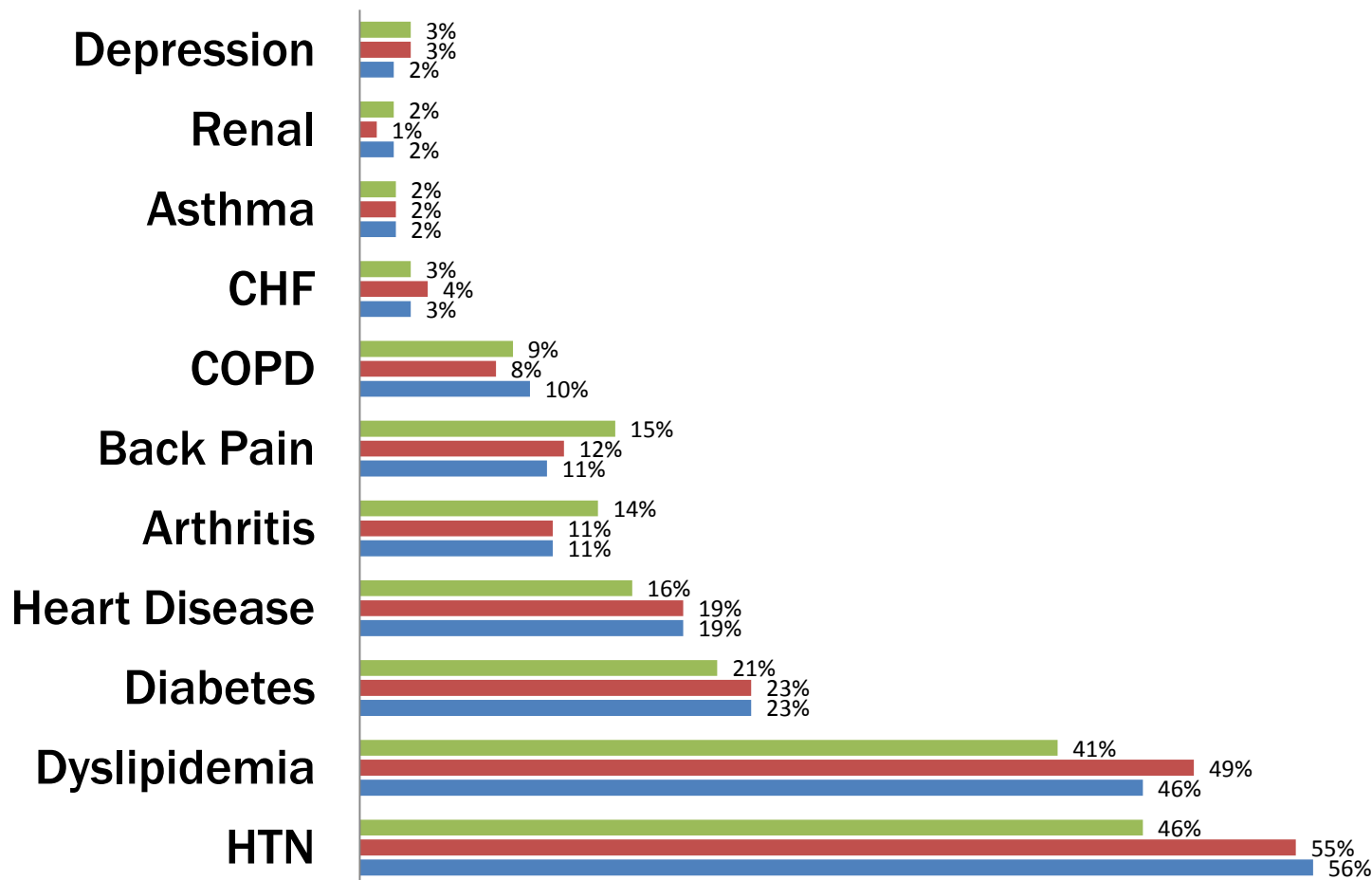


Analysis

- Descriptive Statistics
- Chi-Square of bivariate associations
 - ❖ Provider types and morbidity levels
- Poisson Regression
 - ❖ Evaluated predictors of number of visits during the study period
- Multinomial Logistic Regression
 - ❖ Compared three outcomes
 - Exclusive physician care
 - Exclusive non-physician care
 - Combination of physician & non-physician care
- Linear Regression
 - ❖ Total patient cost by morbidity, provider type, age, & gender

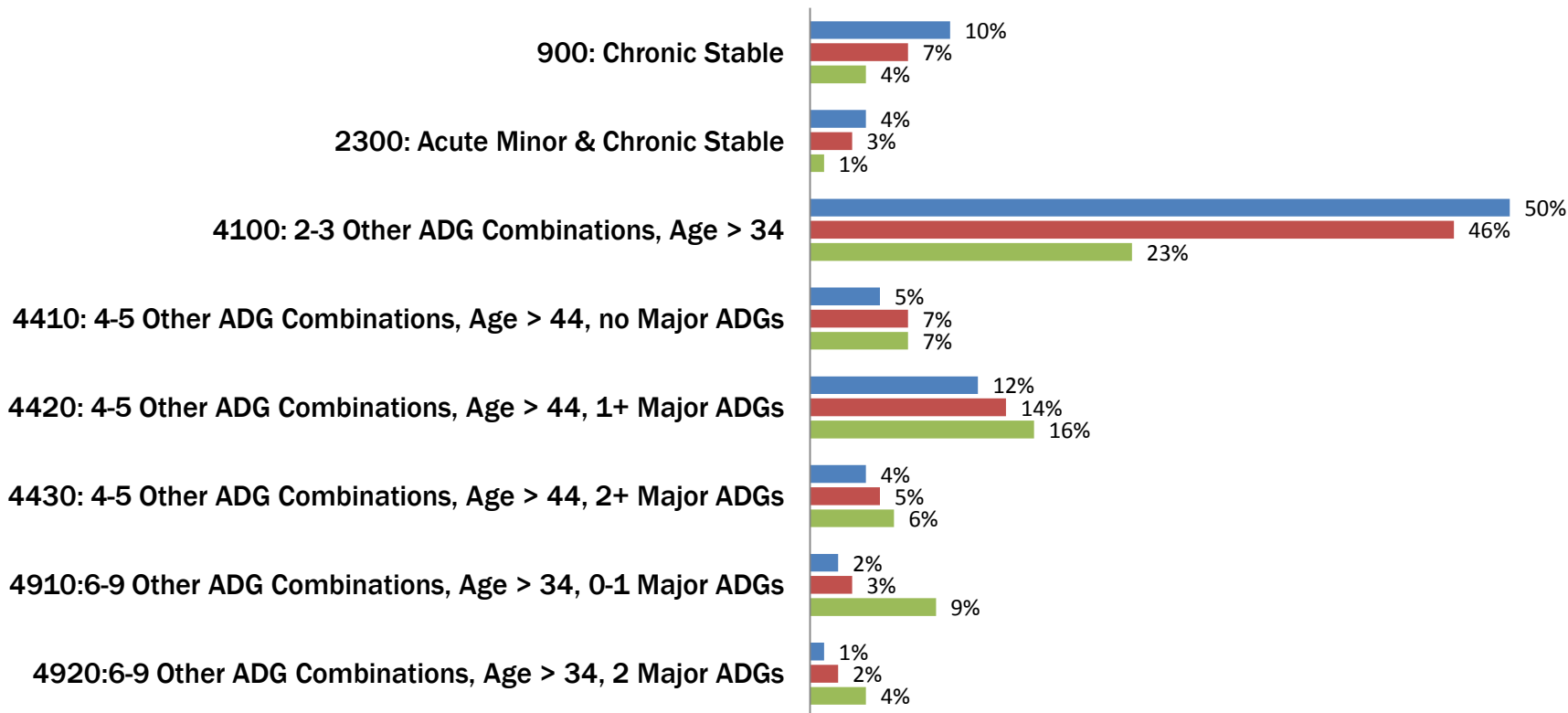
Proportion of Conditions by Provider Type

■ Combination ■ Non-Physician ■ Physician

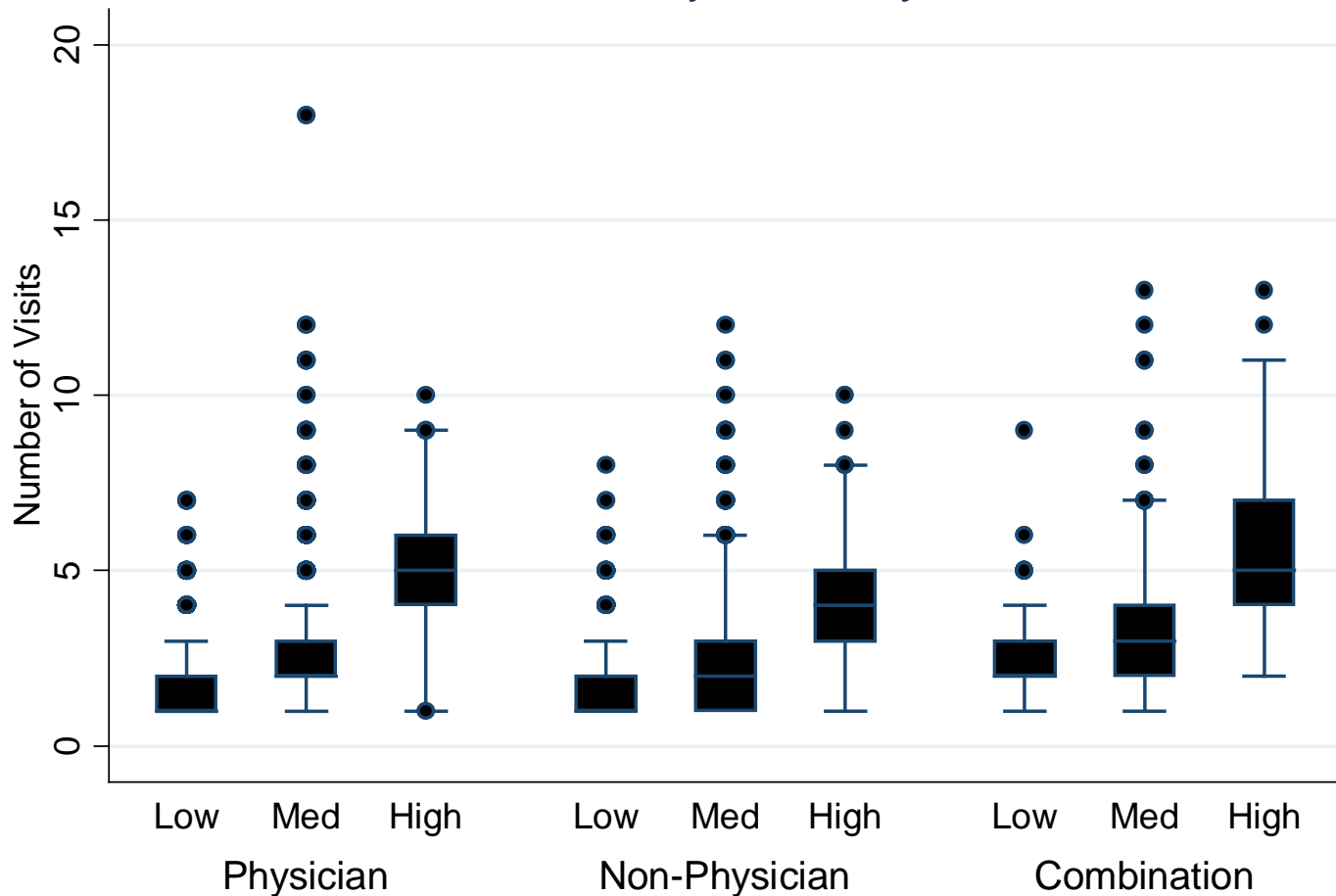


Common ACGs by Provider Type

■ Physician
 ■ Non-Physician
 ■ Combination



Number of Visits by Morbidity & Provider



Poisson Regression Evaluating the Risk of Multiple Visits from Provider Type, Morbidity, Age, and Gender

(N= 18500; Wald $\chi^2(6) = 858.66$; $p < 0.0001$)

Variables	IRR	Robust Standard Error	z	P Value	95% CI	
Physician Only Patients	0.75	0.04	-5.10	0.00	0.67	0.83
Non-Physician Only Patients	0.70	0.04	-5.92	0.00	0.63	0.79
High Morbidity Patients	2.87	0.23	13.14	0.00	2.45	3.36
Medium Morbidity Patients	1.56	0.05	13.47	0.00	1.46	1.67
Age	1.00	0.00	0.28	0.78	1.00	1.00
Gender	0.99	0.02	-0.33	0.74	0.96	1.03

IRR=incidence rate ratios for the Poisson model

Multinomial Logistic Regression

Provider Type Adjusting for Morbidity Burden

(N =18500: Wald chi2 (6); p<0.0001)

Model	RRR	Robust Standard Error	z	P Value	95% CI	
Physician Only Patients						
Male Gender	1.56	0.13	5.31	0.00	1.32	1.84
Age in Decades	1.00	0.01	0.35	0.72	0.98	1.03
Low Morbidity compared to Medium	1.28	0.04	7.33	0.00	1.20	1.36
High Morbidity compared to Medium	0.57	0.08	-3.97	0.00	0.43	0.75

Model	RRR	Robust Standard Error	z	P Value	95% CI	
Combination Provider Patients						
Male Gender	0.86	0.11	-1.23	0.22	0.67	1.10
Age in Decades	0.85	0.02	-7.01	0.00	0.82	0.89
Low Morbidity compared to Medium	0.29	0.02	-17.19	0.00	0.25	0.33
High Morbidity compared to Medium	2.81	0.41	7.07	0.00	2.11	3.75

(Non-Physician-only patients as the base outcome)

Comparison of Physician and Non-Physician Primary Care Patients

Variable	Physician Only N= 11,750			Non-Physician Only N= 5,417			Combination N= 1,331		
	Mean (SD)	Median	IQR	Mean (SD)	Median	IQR	Mean (SD)	Median	IQR
Age	65.3 13.7	67	19	64.9 14	67	19	62.8 14	63	18
Resource Utilization Band (0 to 5)	2.8	3	0	2.9	3	0	2.7	3	0
Chronic Disease Count	0.6 5 5.4	3	4	0.5 5.1 5.7	3	4	0.9 7.7 9.2	6	11

Linear Regression: Provider Type, Morbidity, Age, and Gender on Log(Total Cost)

(N=18420; F=129; $p < 0.0001$; $R^2 = 0.23$)

Variables	Coefficient (β)	Robust Standard Error	t	P Value	95% CI	
Constant	4.06	0.05	73.95	0.00	3.93	4.19
Physician Only	-0.27	0.05	-6.04	0.00	-0.38	-0.17
Non-Physician Only	-0.30	0.02	-12.85	0.00	-0.36	-0.25
High Morbidity	1.10	0.06	19.10	0.00	0.96	1.23
Medium Morbidity	0.45	0.04	12.19	0.00	0.36	0.53
Age	0.00	0.00	0.03	0.98	0.00	0.00
Male Gender	-0.03	0.06	-0.52	0.62	-0.18	0.12



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Conclusions

- We found no significant difference in the morbidity of patients seeing only non-physicians as compared to patients seeing only physicians.
- Patients with a high level of morbidity were more likely to see a combination of provider types for their care during the year and required more visits.
- Cost increased with morbidity and was slightly higher when patients were seen by combination of provider types.



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Limitations

- May not reflect practices outside of the VA
- Does not include large VA medical centers
- Does capture dual-use care during the year
- Possibility of ICD-9 coding errors



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Importance of Case-Mix

- Non-Physicians are likely to continue to grow globally as service demand exceeds supply
- Case-mix of non-physician providers in different settings should be considered
 - ❖ Workforce planning
 - ❖ Clinical roles in chronic disease management
 - ❖ Compensation schemes
 - ❖ Quality Improvement and outcomes