

Racial-Ethnic Trends in Initial Lower Extremity Amputation Rates among Veterans Health Administration Health Care System Users from 2000 to 2004

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VA Trends in LEA by Race/Ethnic

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Lower Extremity Amputations (LEA)

- Catastrophic complication of diabetes
- Most often with long-standing disease, vascular or neuropathic complications
- Potentially preventable by timely and effective ambulatory care
- Considered a preventive quality indicator (PQI) by AHRQ
- Reducing rate of LEAs was a major objective of Healthy People 2010

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VA Policies for Diabetes Foot Care

- Annual foot exams for diabetes since 1996
- Performance measures since 2000 for
 - Use of monofilaments for screening
 - Referral to podiatrists
 - Oversight of multidisciplinary foot care teams by VACO Preservation Amputation Care and Treatment Program (PACT)
- Field based surveys of facility PACT – 2002
 - Evaluate micro-system of foot care
 - Volume of surgery performed
 - Composition and experience of teams
 - Access to vascular surgery

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Previous Studies

- Decline in diabetes LEA rates reported for Medicare FFS patients (1992-2001) and U.S. population (1998-2004 by 37%) based on aggregate data.
- May be due to “denominator effect” – changes in diagnostic criteria and increased screening inflates denominator with more recent-onset, less severe diabetes patients who have lower LEA risk -- need to risk adjust
- No studies of trend differences by race
- Need studies with rich individual level data for better LEA surveillance

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National VA Diabetes Research

- VA surveillance of diabetes outcomes with rich longitudinal patient data
- Diabetes Epidemiology Cohorts (DEpiC)
 - 2+ million diabetes patients - 1998-2007
 - Linked data - VA, Medicare, patient surveys
 - Inpatient, outpatient, long term care
 - Prescriptions
 - Diagnoses
 - Procedures
 - Laboratory test results
 - Patient characteristics
 - Self-report measures
 - Funded through VA Epidemiology & HSR&D 10 year collaboration of Pogach and Miller
 - Long record of research and service work

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Research Questions

With recent implementation of national diabetes foot care policies . . .

- What has been the trend in rates of initial major, minor, and total LEA taking into account changes in the diabetes patient population over time?
- Have trends in LEA rates varied across different racial/ ethnic groups?

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Methods I – Samples & Outcomes

- Annual serial cross-sectional samples of all VA diabetes patients in DEpiC without prior LEA across fiscal years (FY) 2000-2004.
- To identify only initial LEA, samples were restricted to those without prior codes (over at least 24 months) for prior amputation or post-amputation care such as lower limb prosthesis.
- Initial LEA were identified by procedure codes from VA and Medicare FFS records, distinguishing minor (foot) and major (above) amputations.

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Methods II – Patient Data

- Race/ethnicity data in DEpiC (best estimate from various sources) provided for comparison of:
 - White, non-Hispanic
 - African American
 - Hispanic
 - Other (Native American, Pacific Islander, Asian)

- Other data in adjustment models included:
 - Demographics (sex, age, marital status, region, rurality)
 - Medicare and VA enrollment (priority status),
 - History of macrovascular, microvascular, and metabolic complications.

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Methods III - Analysis

- Calculated annual rates of initial LEA – crude and directly standardized for age and sex (using FY2000 as reference population).
- To evaluate adjusted trends over the 5 year period, we used multiple logistic regression.
- Differences in trends by race were evaluated with interaction terms in the regression models.

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Results – Population by Race/Ethnicity

Samples are limited in each year to VA diabetes patients, with service use in current and past year, and with no prior LEA.

FY	Sample	White	Black	Hispanic	Other
2000	405,580	76.2%	18.5%	3.3%	1.9%
2001	454,221	76.5%	18.2%	3.4%	1.9%
2002	514,970	77.2%	17.6%	3.3%	1.9%
2003	651,752	79.7%	15.6%	2.9%	1.8%
2004	739,377	80.4%	15.0%	2.9%	1.8%

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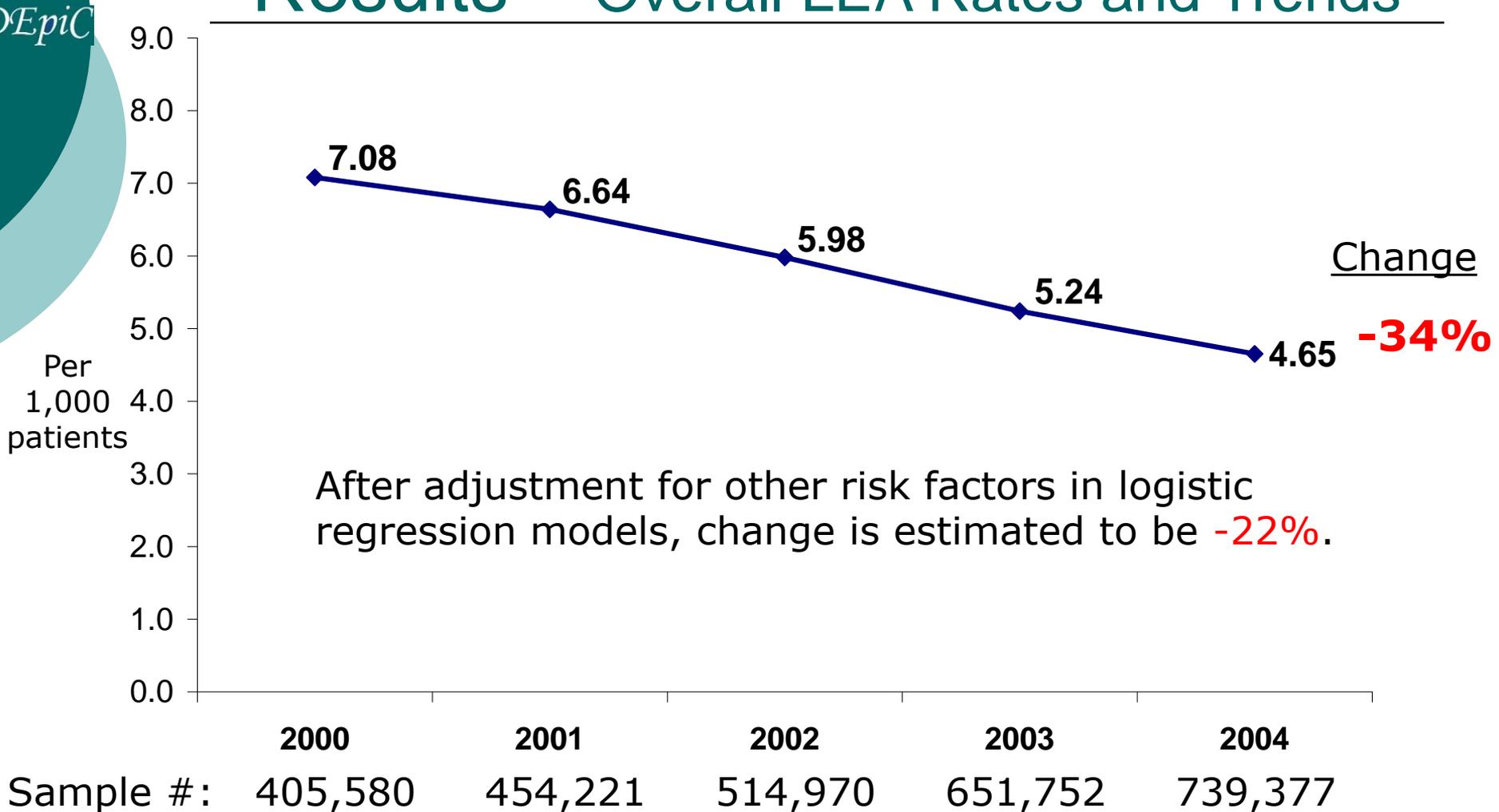
Results — Population Characteristics (FY 2000)

	All 405,580	White 76.2%	Black 18.5%	Hispanic 3.3%	Other 1.9%
Age 65+	62.3%	67.8%	49.8%	53.3%	50.8%
Female	2.6%	2.5%	2.8%	1.9%	2.6%
Not married	39.6%	36.4%	53.0%	37.5%	37.9%
Rural	41.4%	47.0%	22.3%	27.4%	36.6%
Insulin use	29.7%	28.1%	36.5%	30.6%	27.6%
Microvascular	39.2%	39.2%	42.1%	36.5%	40.4%
Macrovascular	54.0%	58.9%	42.2%	40.8%	45.8%
Metabolic	27.9%	28.0%	28.2%	26.7%	27.8%

Minority patients are generally younger, less often married, more urban, and more often insulin users; after adjustment for age (not shown), they more often have microvascular disease.

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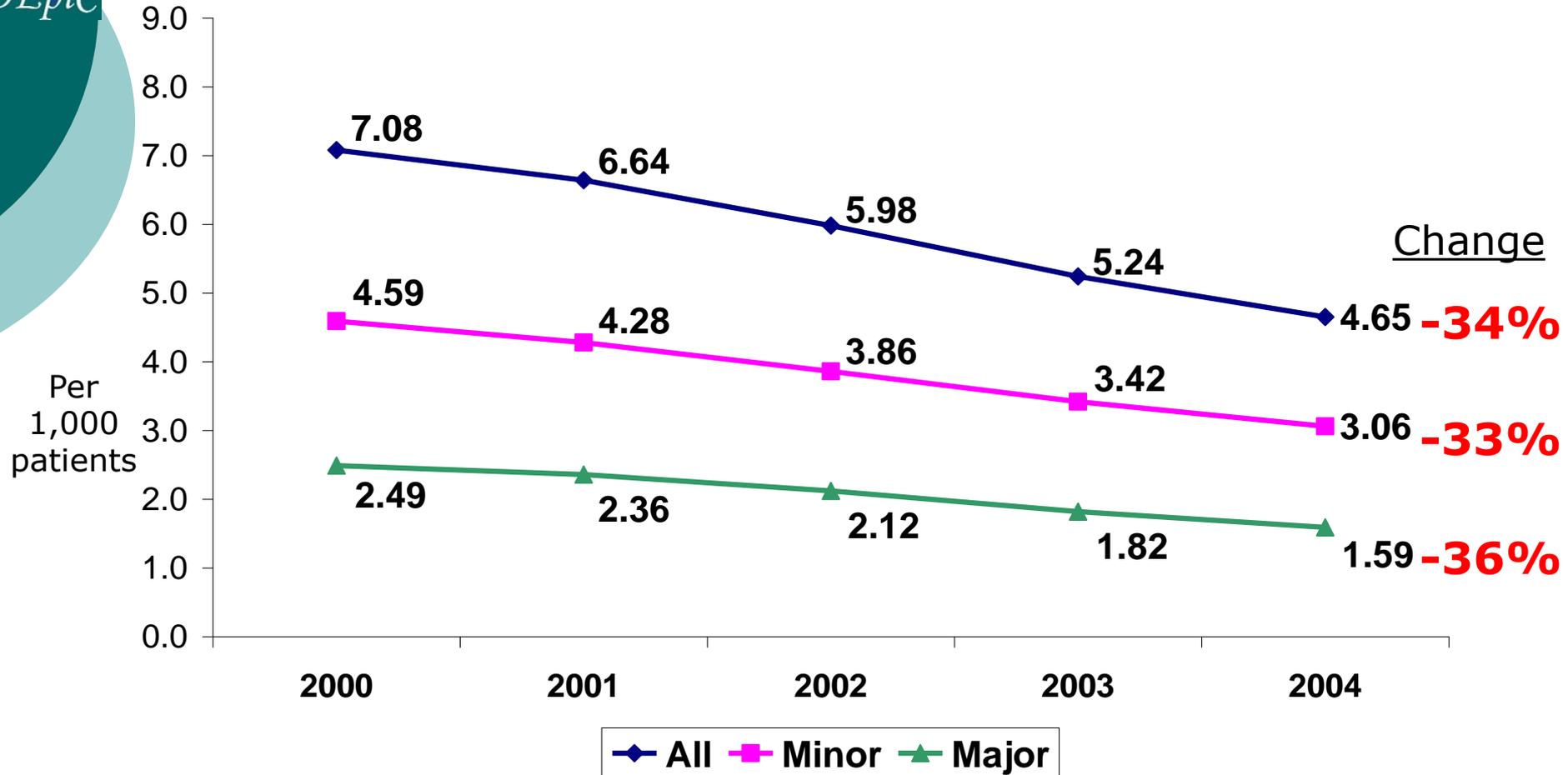
Results – Overall LEA Rates and Trends



All rates are standardized for age and sex to overall distribution in FY2000

VA Trends in LEA by Race/Ethnic

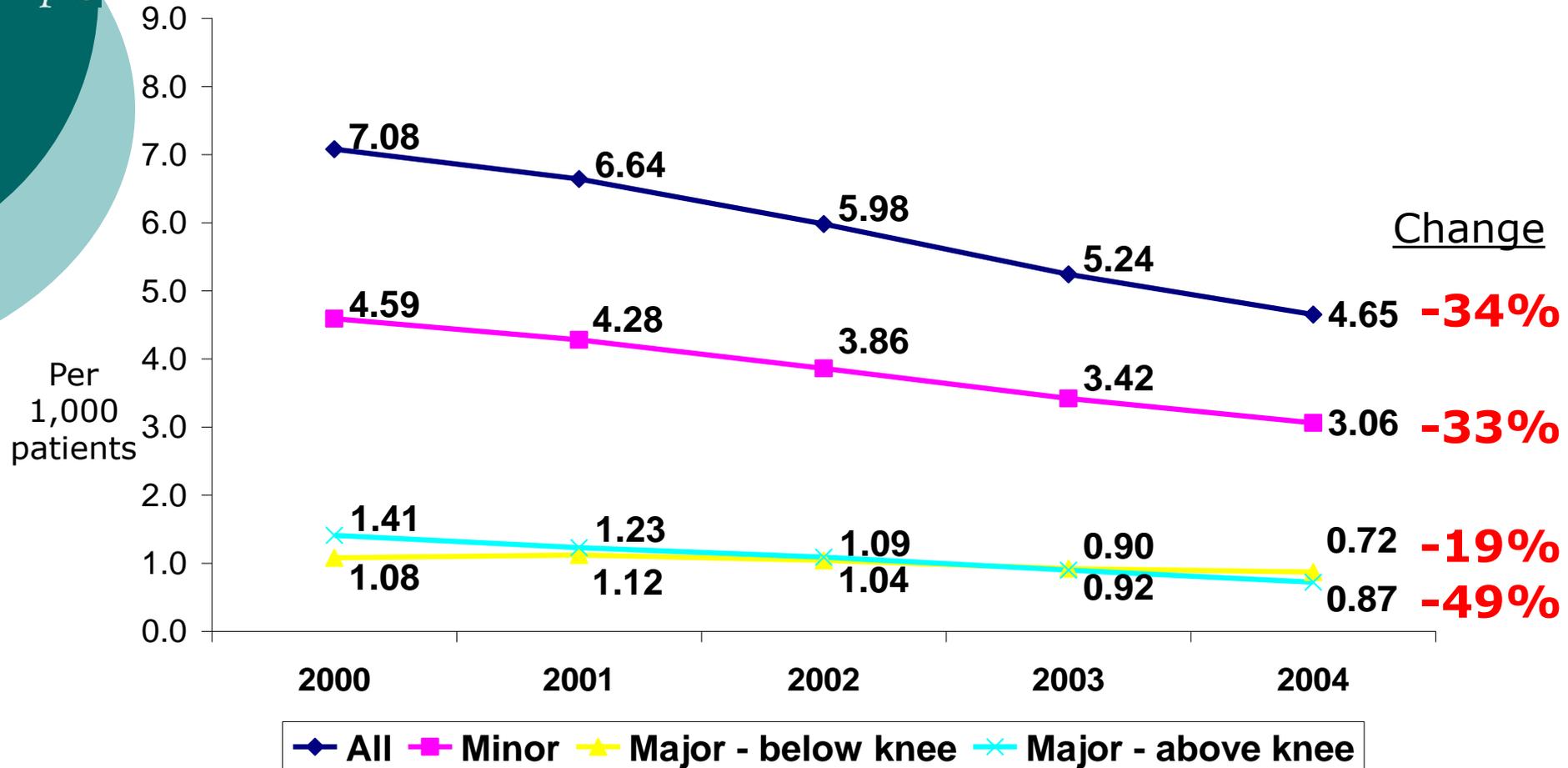
Results – LEA Rates and Trends by Type



All rates are standardized for age and sex to overall distribution in FY2000

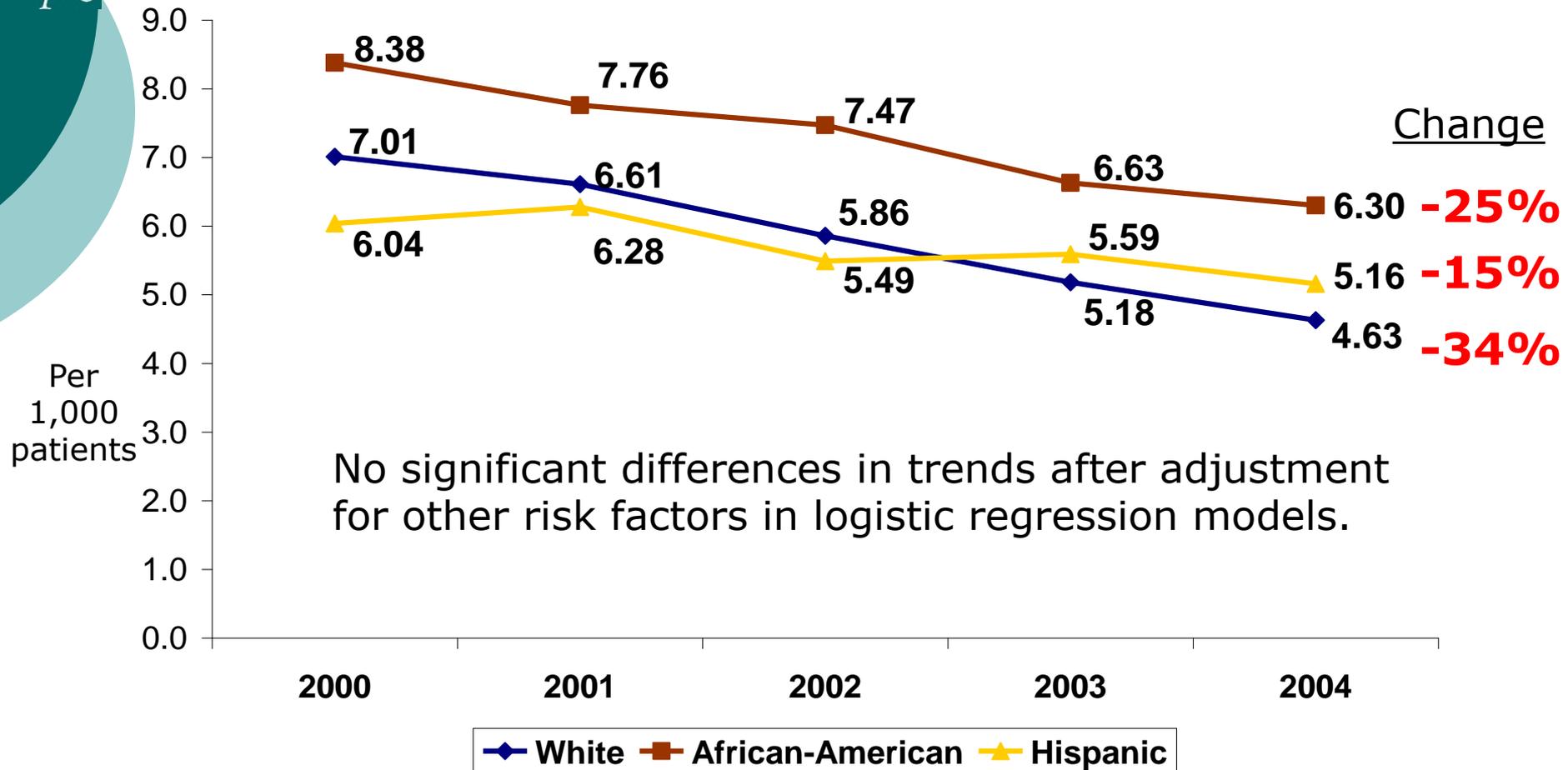
VA Trends in LEA by Race/Ethnic

Results – LEA Rates and Trends by Type



VA Trends in LEA by Race/Ethnic

Results – LEA Rates by Race/ Ethnicity



VA Trends in LEA by Race/Ethnic

Limitations

- Despite use of rich patient level data, residual differences in risk over time could still account for part of observed trends; only limited data on:
 - Duration of diabetes
 - Severity of complications
 - Smoking and other lifestyle risk factors
 - Personal foot care
- Possible under-coding of LEA risk factors, e.g. insensate foot (neuropathy).
- Use of non-VA by many patients limits ability to ascribe results entirely to care provided by VA.

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Conclusions

- Initial LEA rates declined in VA by 34% over 5 years; even after risk adjustment, there was a 22% drop in rates.
- Rates dropped for all initial amputations, with the greatest decline seen for above knee amputations
- Improvements observed for all racial/ethnic groups; despite some differences in trends, no significant trend differences between groups.
- Though African Americans still have higher initial LEA rates, differences in VA are much less than what has been reported for other systems of care

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Implications

- Our findings suggest that national efforts to prevent amputations among VA diabetes patients were effective with comparable benefits across racial/ethnic groups.
- Results will be presented to VACO leadership for consideration of inclusion in PACT reports to external oversight committees
- Demonstrates value of surveillance for LEA in diabetes patient population and need for continued evaluations using rich data sources.