

Silicosis Prevalence Among Medicare Beneficiaries, 1999–2014

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Nurse Epidemiologist

**Expanding Research Partnerships:
State of the Science
June 21, 2017**

What is Medicare?

- **Federal health insurance program**
- **Provides health insurance to:**
 - People aged 65+
 - Individuals determined to be disabled by Social Security Administration
 - People with End Stage Renal Disease

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98%

Of Americans aged 65 and over enrolled in Medicare

McBean M. Introduction to the Use of Medicare Data for Research: Research Data Assistance Center (ResDAC); 2012. Available from:<http://www.resdac.org/sites/resdac.umn.edu/files/Overview%20of%20the%20Medicare%20Program%20%28Slides%29.pdf> Accessed May 31, 2017.

A

- **Hospital**
- **Skilled Nursing Facility**
- **Other institutional care**

B

- **Physician services**
- **Home health services**
- **Other outpatient care**

C

- **Medicare Advantage (Managed Care)**
- **Medicare Parts A & B**
- **Most offer Medicare Part D**

D

- **Drug coverage**

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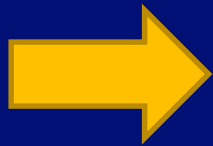
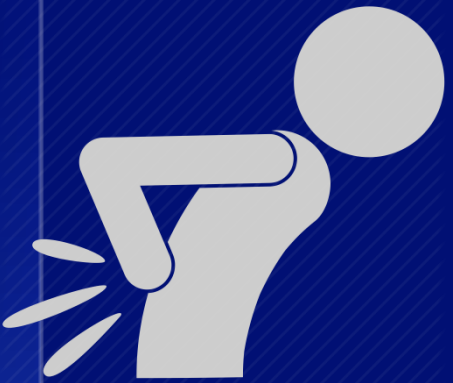
- **Drug coverage**

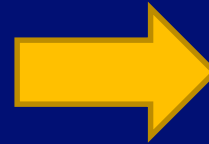
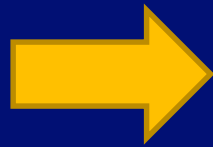
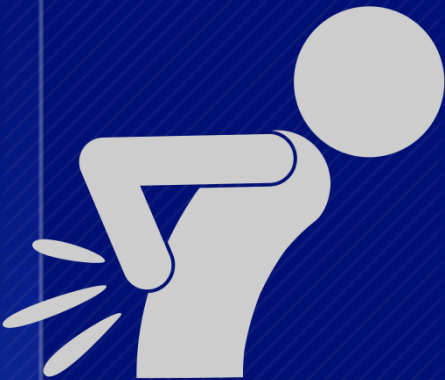
Medicare Claims and Enrollment Data

- **Enrollment Data**
 - Demographic information
 - Insurance coverage information
 - Date of death
- **Utilization Data (Medical Claims)**
 - Treatments or procedures
 - Medical visits and hospitalizations
 - Diagnosis codes
 - Charges and payments

Limitations of Medicare Data

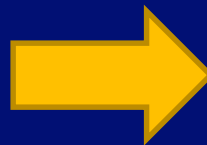
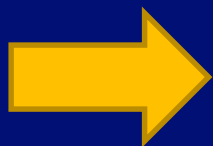
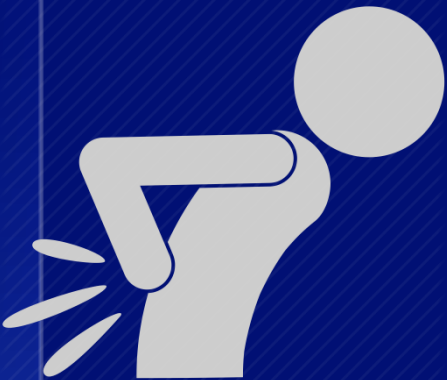
- **No industry or occupation information**
 - Limited to diseases that are largely related to occupation
 - Have a separate diagnosis code
- **Payment system, not surveillance system**
- **Diagnosis on claim ≠ clinical diagnosis**





“Spondylosis,
lumbar region”

MetroHealth		PATIENT NAME	GUARANTOR NO.	MEDICAL RECORD NO. (MNI)
The MetroHealth System PO Box 937023 Cleveland, OH 44193-1191				
PAY THIS AMOUNT		BILL DATE	DUE DATE	CURRENT INSURANCE
\$1,231.62				UNITED HEALTHCARE
SERVICES	CHARGES	INSURANCE PAYMENTS	PATIENT PAYMENTS	INSURANCE BALANCE
Thank you for choosing the MetroHealth System for your healthcare needs				
06/16 Physician Services - Account # Emergency Visit, Level 4 Total Insurance Adjustments Total Insurance Payments	306.00	176.06 103.95		\$25.99
Hospital Services				
Account # Emergency Room Total Insurance Payments	1,213.00	850.40		\$362.60
11/9/16 Physician Services - Account # Anesthesia, Extraperitoneal Anesthesia, Extraperitoneal Total Insurance Adjustments Total Insurance Payments	1,166.20 1,166.20	1,749.30 466.48		\$116.62
Physician Services - Account # Anesthesia, Sling Operation Total Insurance Adjustments Total Insurance Payments	3,853.00	2,666.95 758.53		\$197.21
** Continued on Next Page **				



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1/9/16 Physician Services - Account # Anesthesia, Extraperitoneal Anesthesia, Extraperitoneal Total Insurance Adjustments Total Insurance Payments						Jennifer, MD 1,166.20 1,166.20 1,749.30 466.48				\$116.62
Physician Services - Account # Anesthesia, Sling Operation Total Insurance Adjustments Total Insurance Payments						Irma J., MD - Your account is past due. 3,853.00 2,666.95 758.93				\$197.21



Silicosis

- Permanent and progressive scarring of the lungs
- Caused by inhaling free crystalline silica
- Largely due to a preventable occupational exposure
- ICD-9 Diagnosis code '502' - *Pneumoconiosis due to other silica or silicates*
 - International Classification of Diseases, Ninth Revision (ICD-9)

Silicosis

- **Three forms**
 - Acute (Weeks to years)
 - Accelerated (Less than 10 years)
 - Chronic (10-30 years)

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Objectives

- What is the prevalence of silicosis among Medicare beneficiaries aged 65+?
- Has the prevalence of silicosis among Medicare beneficiaries aged 65+ changed over time?

74,979,748 beneficiaries on Medicare due to age (65+)
1999–2014



Defining Conditions in Medicare Data

Defining Conditions in Medicare Data

- Medicare definition example

Asthma

Any diagnosis code of '493' on at least 1 inpatient, skilled nursing or home health claim

OR

Any diagnosis code of '493' on at least 2 outpatient claims within one year

Silicosis Case Definition

- **Based on other Medicare definitions:**

Silicosis

Any diagnosis code of '502' on at least 1 inpatient, skilled nursing or home health claim

OR

Any diagnosis code of '502' on at least 2 outpatient claims within one year

74,979,748 beneficiaries on Medicare due to age (65+)
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25,684 beneficiaries with a silicosis
(ICD-9= '502') claim



14,989 beneficiaries met silicosis definition
(1 inpatient, skilled nursing facility, home health
agency claim or 2 outpatient claims within 1 year)

Prevalent Silicosis Cases 1999–2014

- **N= 14,989**
 - **20 per 100,000 Medicare 65+ beneficiaries**
- **Sex**

	N	%	Rate per 100,000
Male	13,438	90%	40.2
Female	1,551	10%	3.7

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- **N= 14,989**
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- **Race/Ethnicity**

	N	%	Rate per 100,000
White	12,478	83%	19.8
Black	1,605	11%	24.6
Other	90	1%	5.5
Asian	83	1%	6.0
Hispanic	327	2%	21.4
N. American Native	377	3%	140.7

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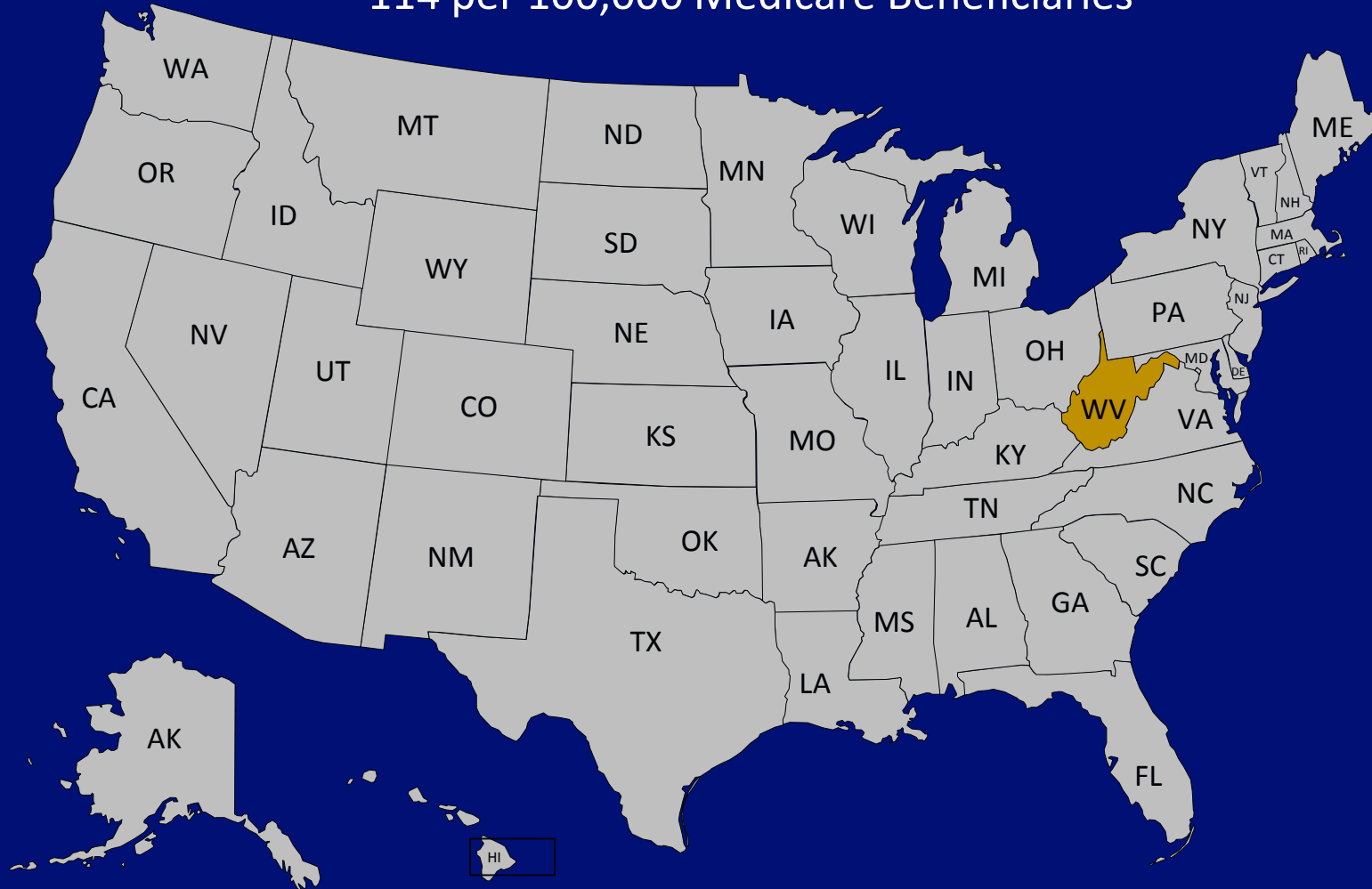
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Prevalent Silicosis Cases 1999–2014

West Virginia

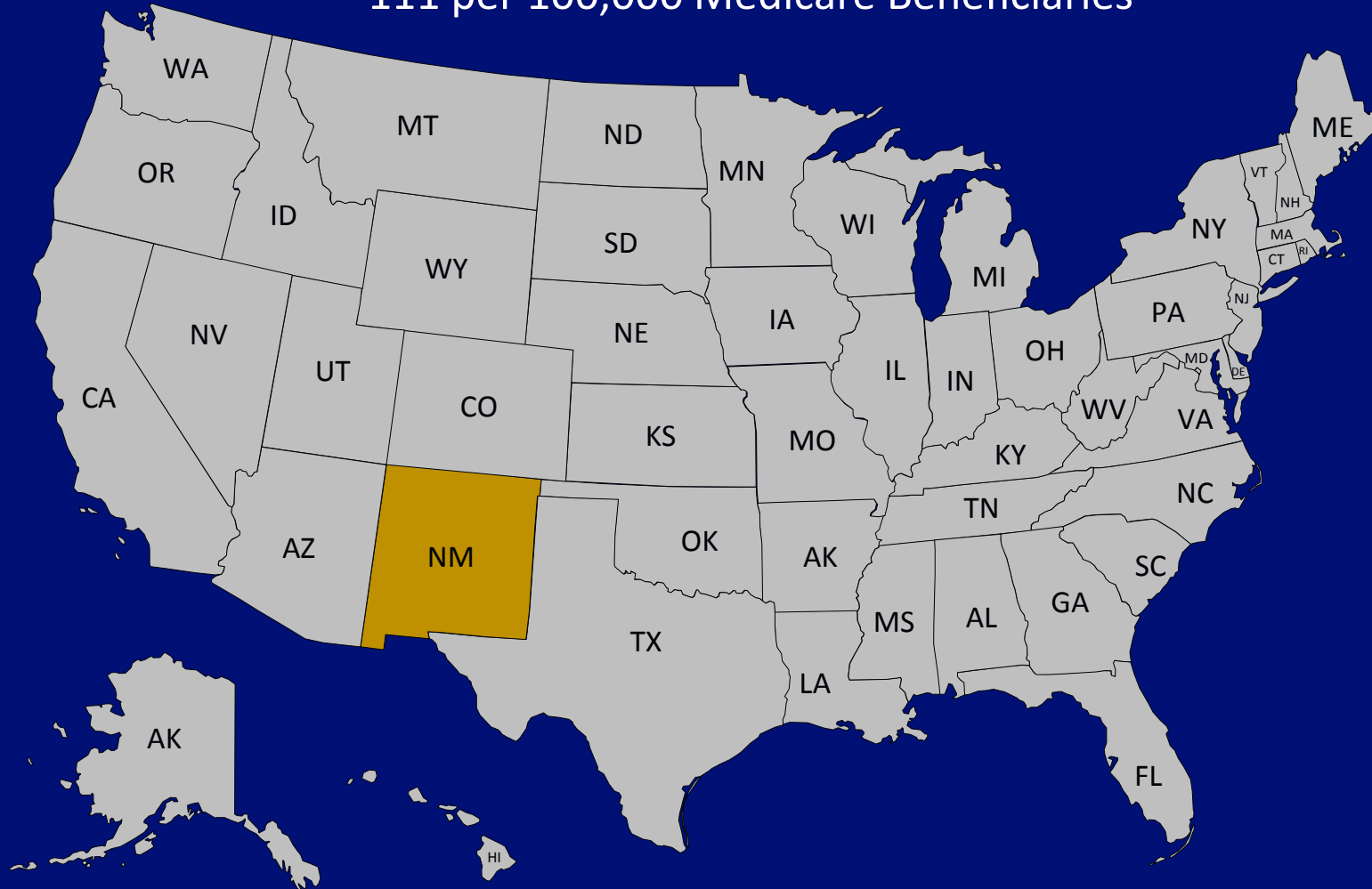
114 per 100,000 Medicare Beneficiaries



Prevalent Silicosis Cases 1999–2014

New Mexico

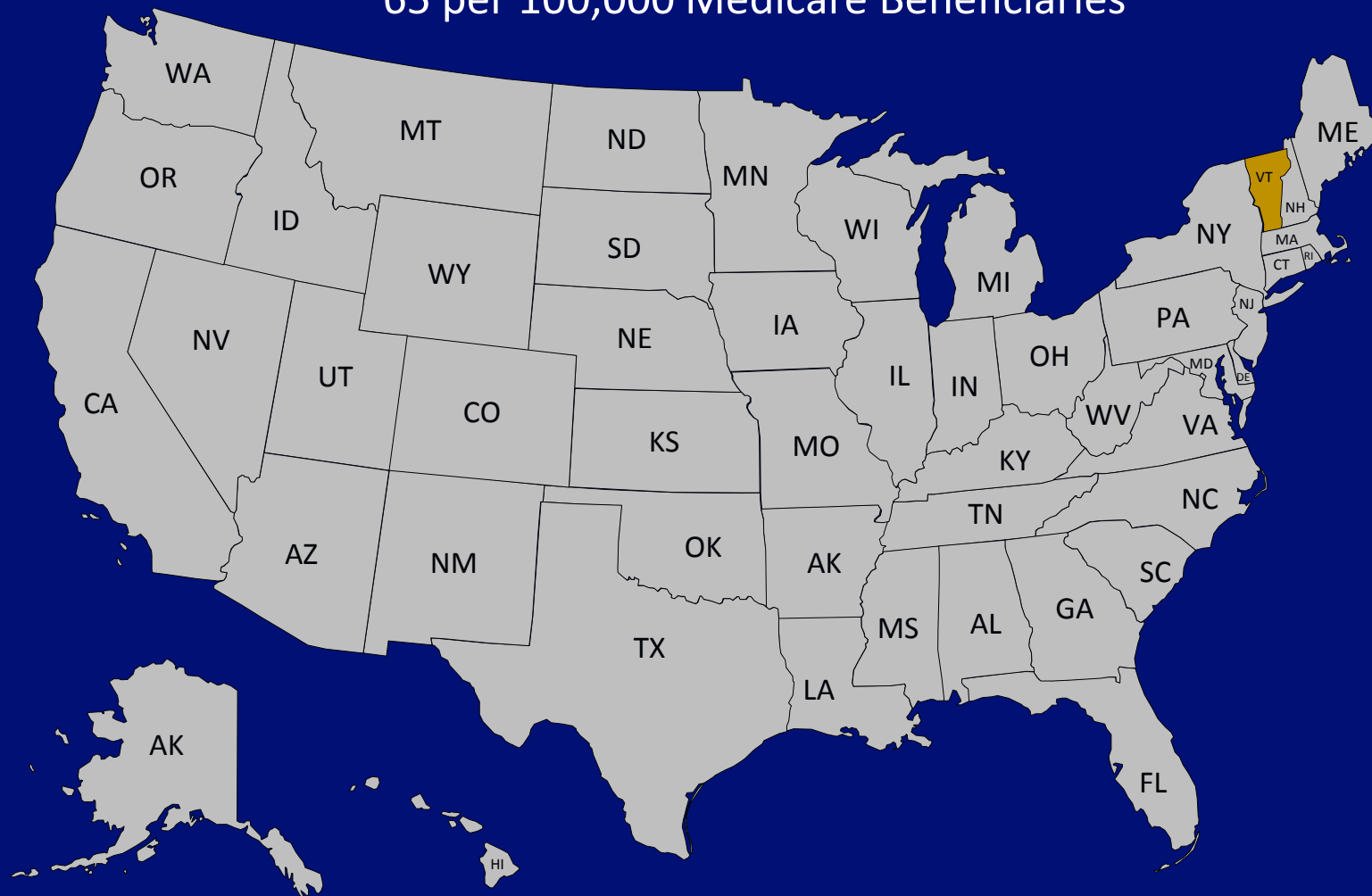
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Prevalent Silicosis Cases 1999–2014

Vermont

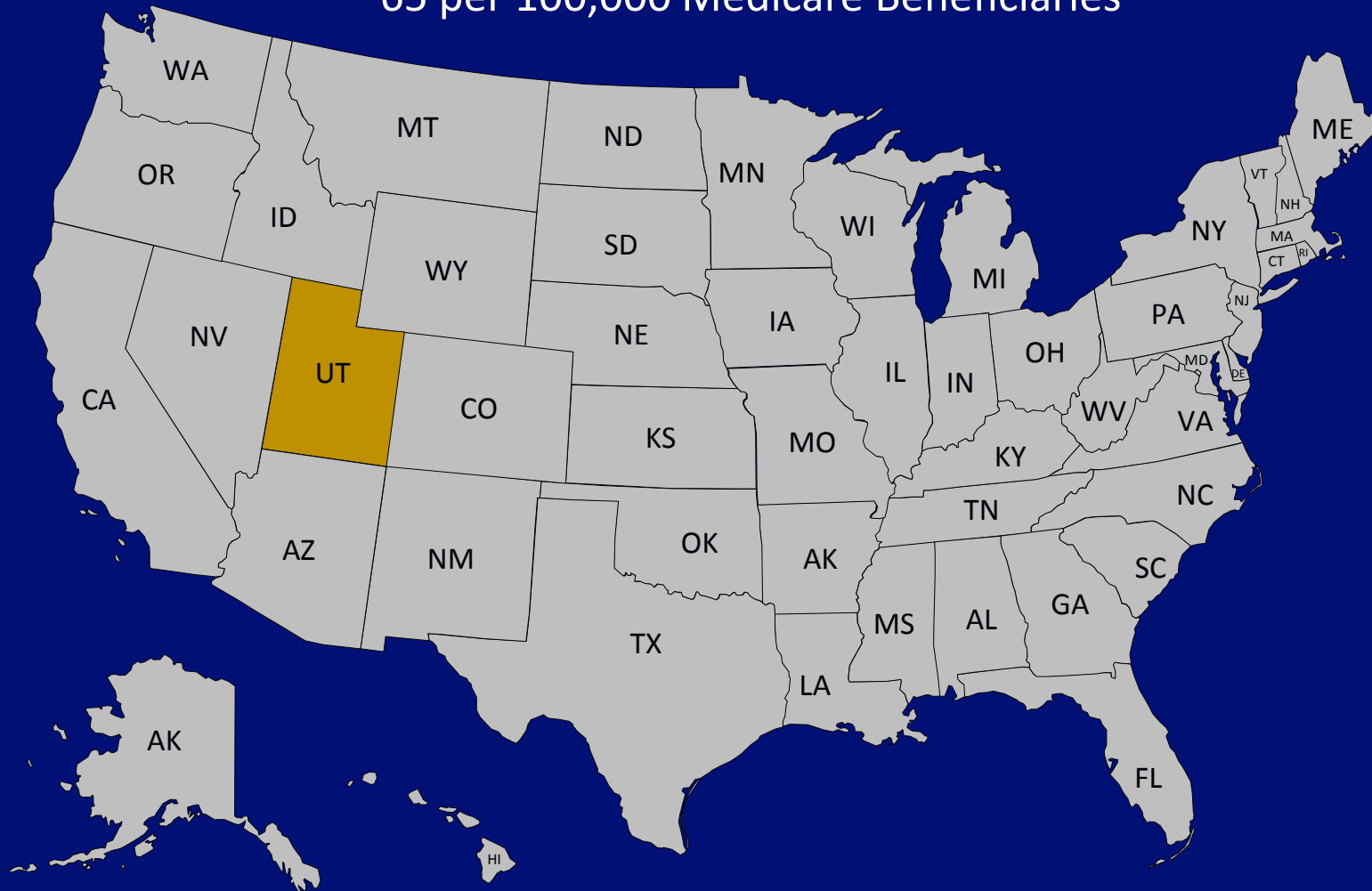
65 per 100,000 Medicare Beneficiaries



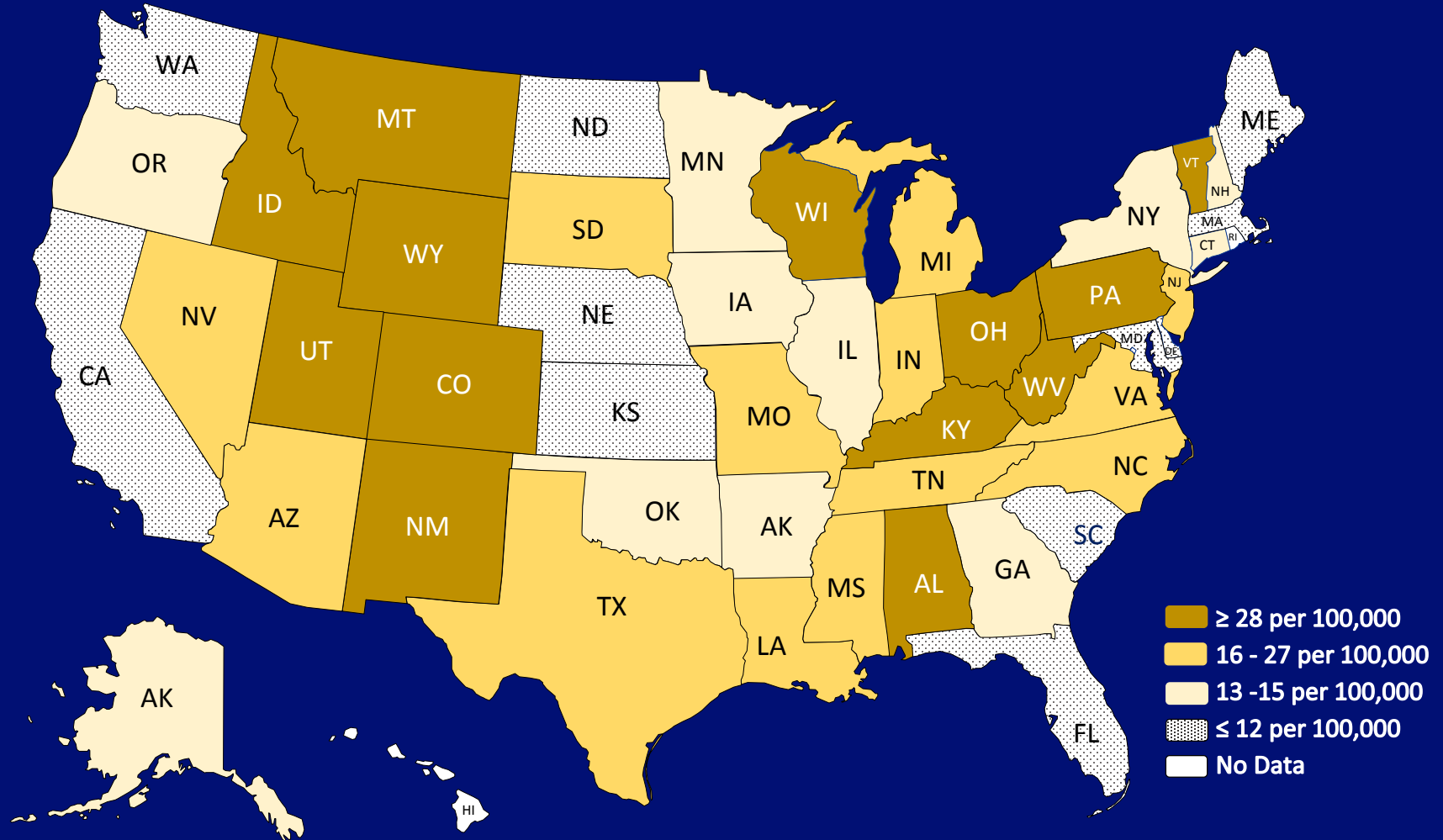
Prevalent Silicosis Cases 1999–2014

Utah

65 per 100,000 Medicare Beneficiaries



Prevalent Silicosis Cases 1999–2014



Prevalent Silicosis Cases 1999–2014

- **N= 14,989**
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- **Original Medicare Enrollment Reason**

	N	%	Rate per 100,000
Aged 65+	11,311	75%	16.8
Disability	3,672	24%	49.0

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1999

2000

2001

2002

2003

.....

2014

Year of 1st

Claim

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

....

2014

**Cumulative
Silicosis
Prevalence**

	1999	2000	2001	2002	2003	2014
Year of 1st Claim							
1999	1,819						
2000							
2001							
2002							
2003							
2004							
2005							
2006							
2007							
2008							
....							
2014							
Cumulative Silicosis Prevalence							

	1999	2000	2001	2002	2003	2014
Year of 1st Claim							
1999	1,819	1,486					
2000							
2001							
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2003							
2004							
2005							
2006							
2007							
2008							
....							
2014							
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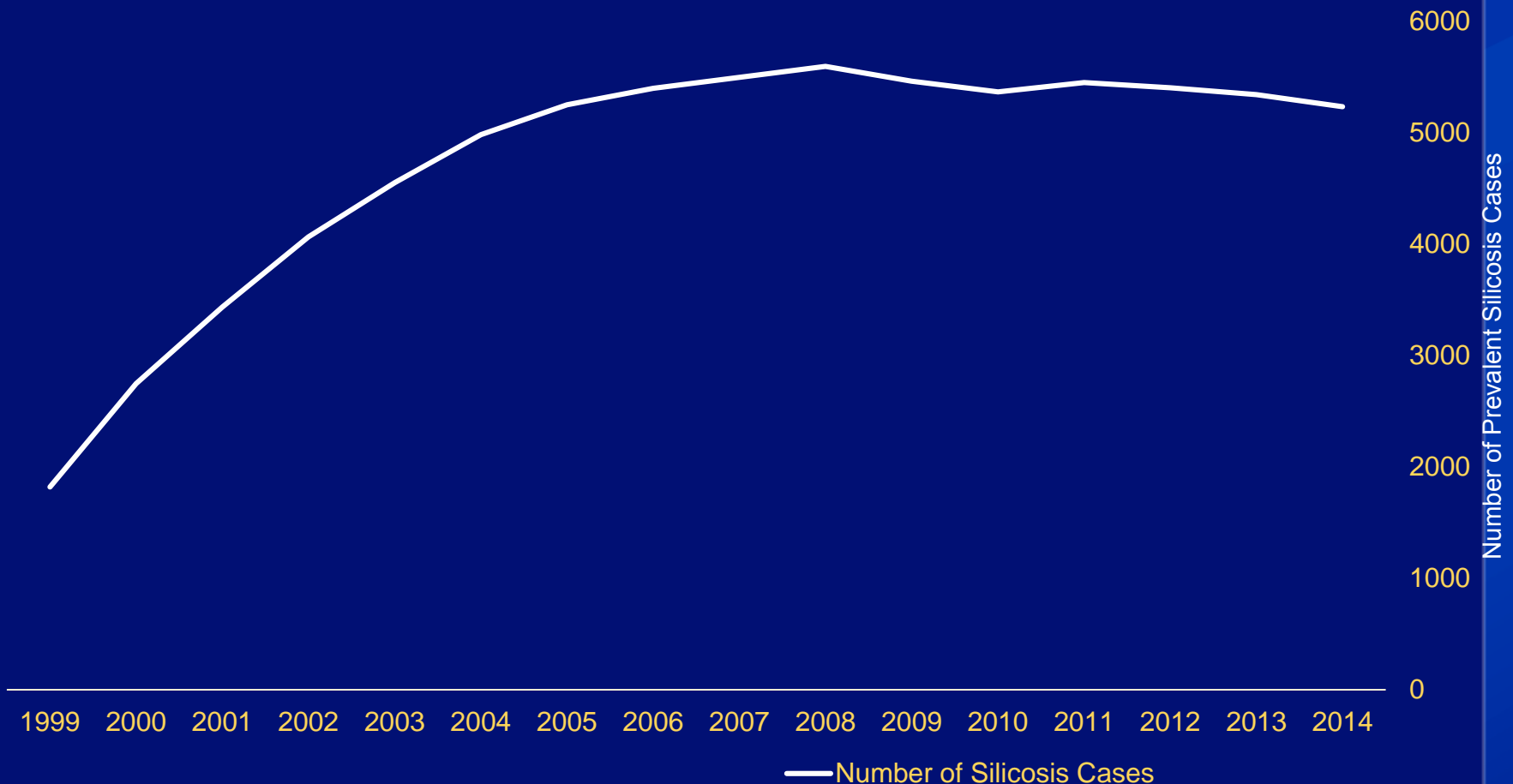
	1999	2000	2001	2002	2003	2014
Year of 1st Claim							
1999	1,819	1,486	1,209	1,028	872		157
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2001			1,163	960	806		178
2002				1,225	1,037		245
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2004							275
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....						
2014							609

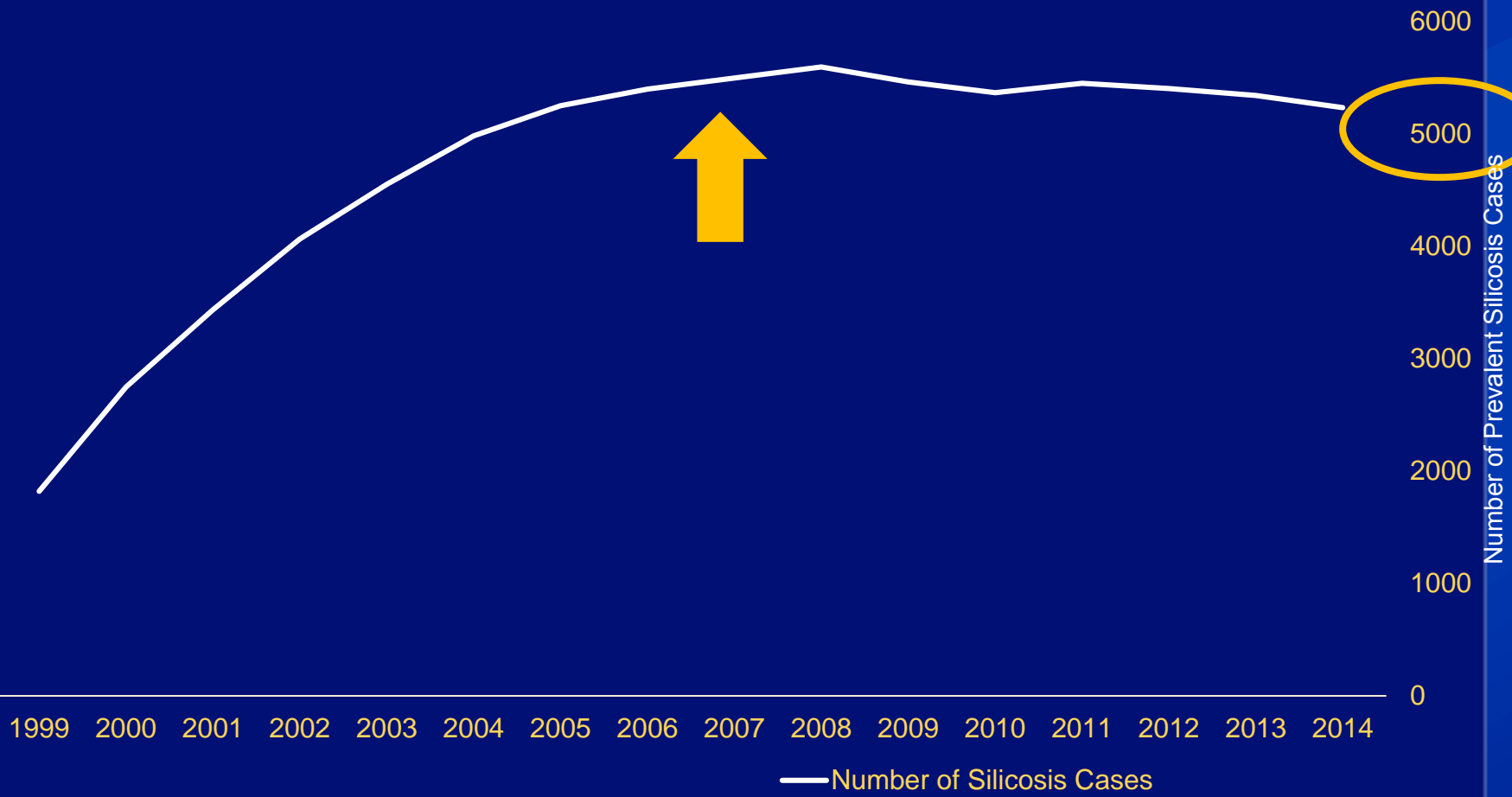
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Cumulative Silicosis Prevalence	1,819	2,748	3,435	4,067	4,554	4,984	5,253

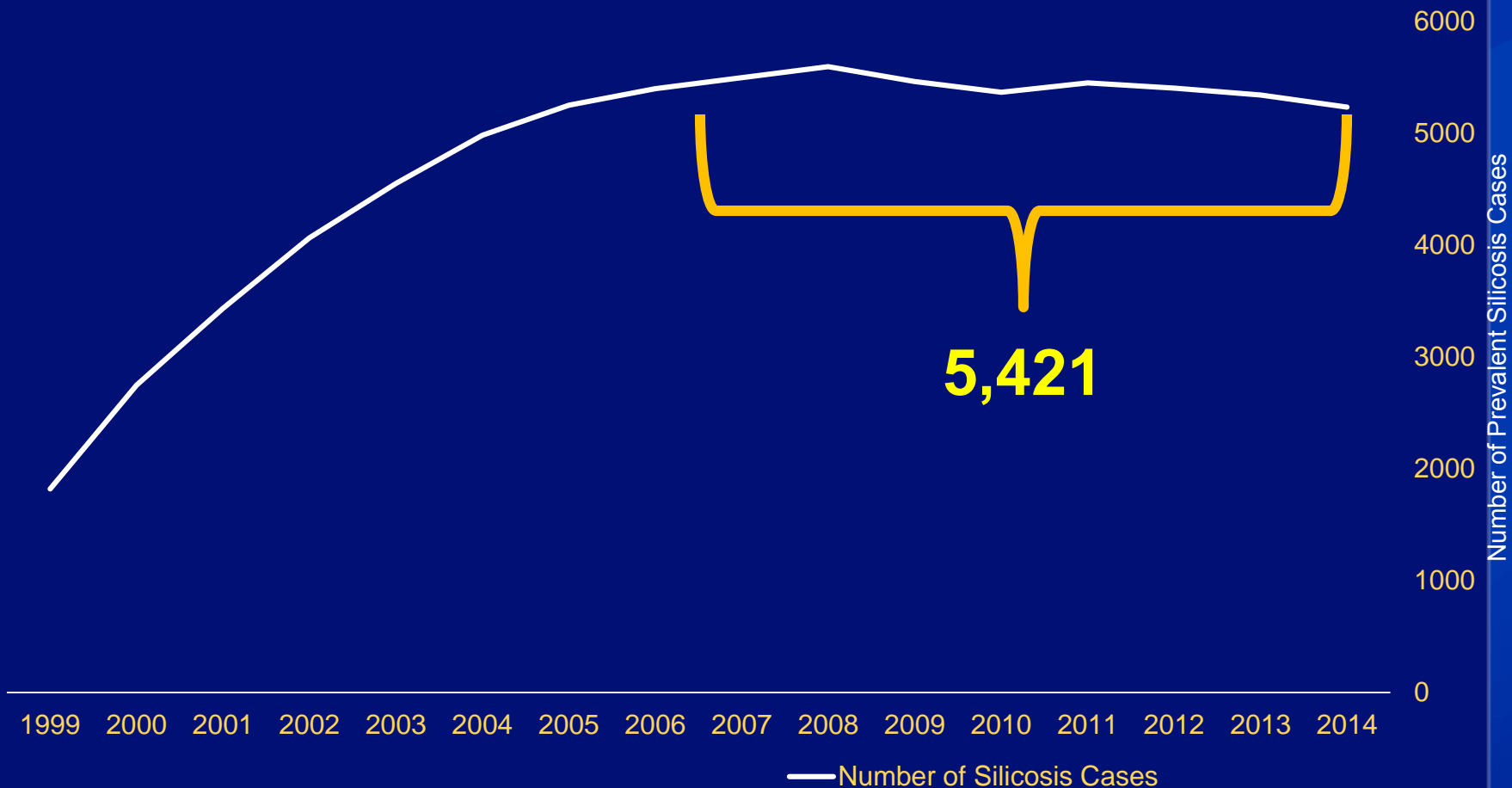
Cumulative Silicosis Prevalence Among Medicare Beneficiaries Aged 65+ 1999–2014



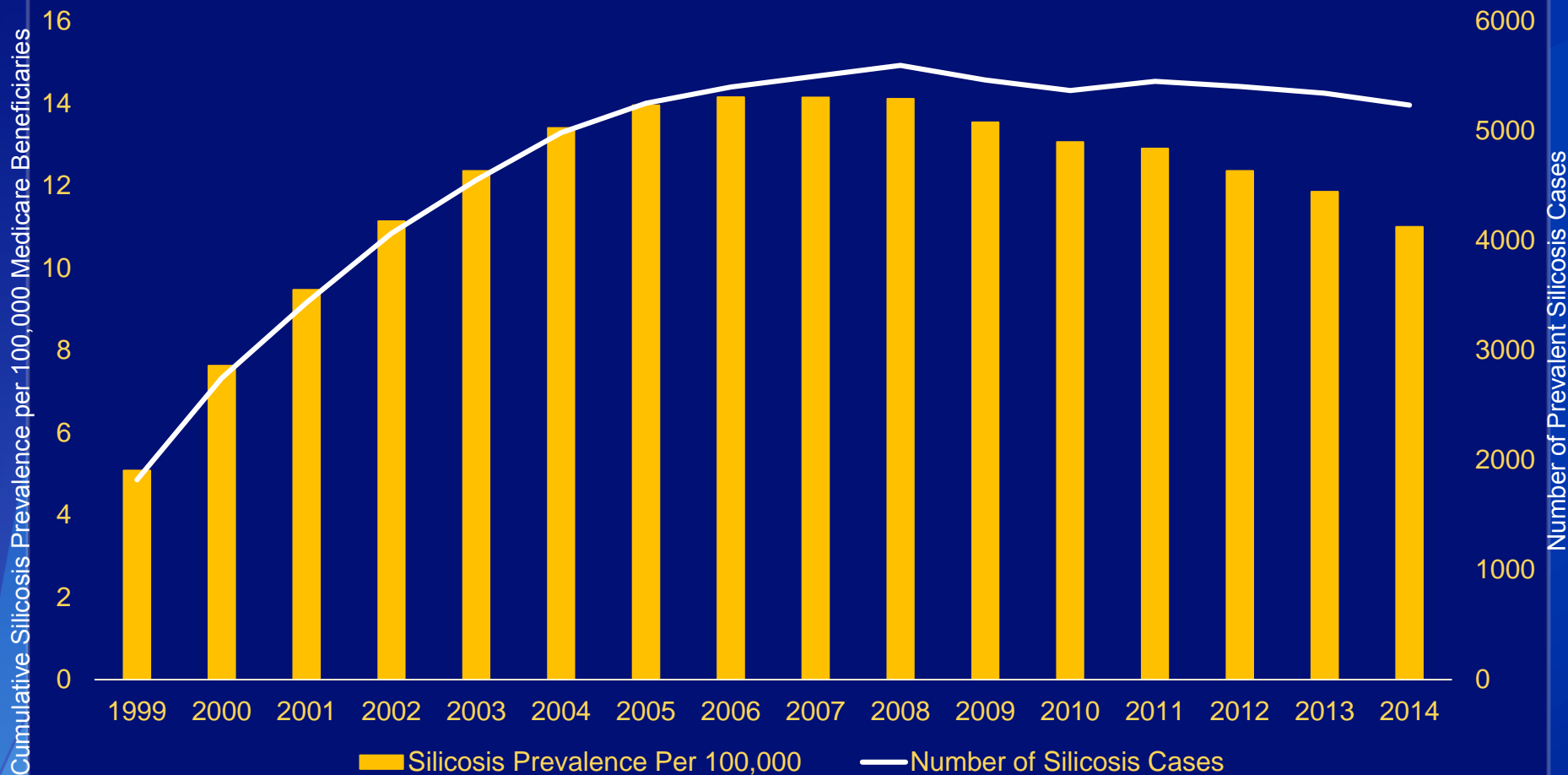
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Cumulative Silicosis Prevalence Among Medicare Beneficiaries Aged 65+ 1999–2014



Cumulative Silicosis Prevalence Among Medicare Beneficiaries Aged 65+ 1999–2014



Conclusions

- **The prevalence of silicosis among Medicare beneficiaries from 1999–2014 was 1 per 5,000**
- **States with the highest prevalence of Medicare beneficiaries with silicosis were WV, NM, VT and UT**
- **The number of prevalent silicosis cases has remained relatively steady since 2007**
 - Roughly 5,400 cases per year

Limitations

- **Diagnosis on claim \neq clinical diagnosis**
- **No validation of case definition**
- **Survivor Bias**
- **Silicosis claims in other systems**
 - Outpatient claims paid by HMOs
 - Dual Enrollment in Medicaid
 - Workers' Compensation
 - Supplemental insurance

\$40,365

**Average hospital* cost for a silicosis
inpatient stay in 2011**

* Facility claims only- does not include professional claims

Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality (AHRQ). Available at:
<https://hcupnet.ahrq.gov/#setup> Accessed June 2, 2017.

Opportunities

- **Surveillance for occupational lung disease morbidity**
- **Opportunity to see changes or trends over time**
- **Characterization of the healthcare burden imposed by occupational lung disease**
- **Inform how silicosis and other diseases are defined in electronic health data sources**

Thank you!

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

National Institute for Occupational Safety and Health
Respiratory Health Division

