

Variation in Use of Hospital Inpatient Resources in End-of-Life Care in Massachusetts

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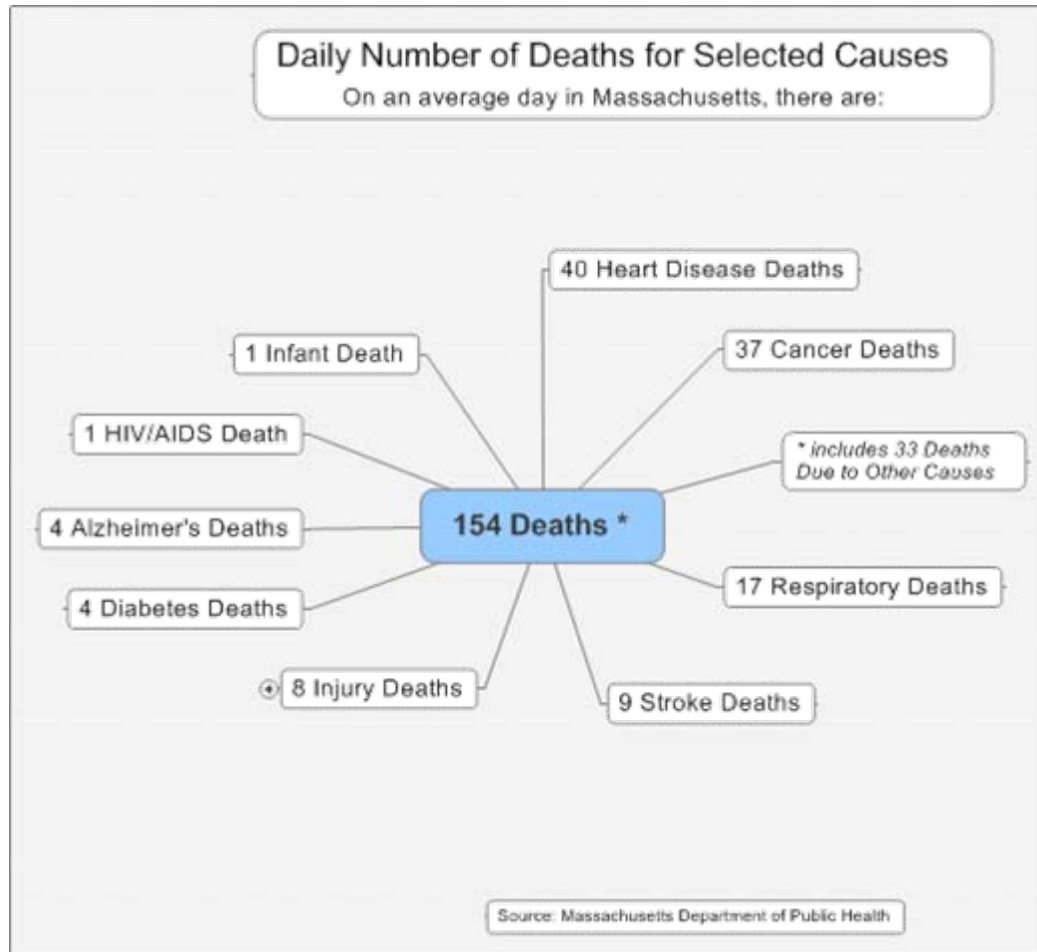
Massachusetts Division of Health Care Finance and Policy

October 2006

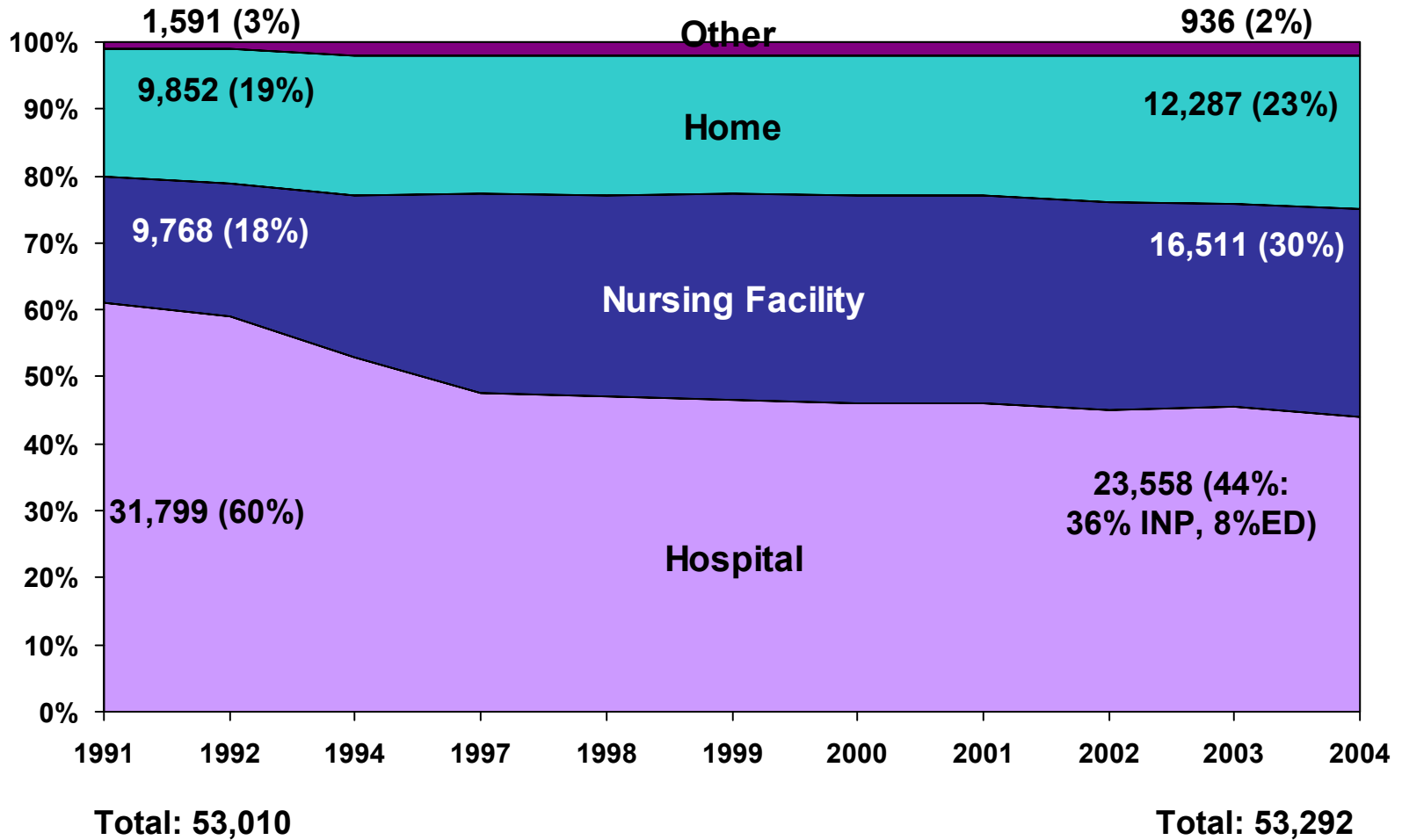
Agenda

- **Introduction**
- Study methodology
- Variations in resource use
- Possible explanation for the variations
- Summary

A Day in the ... of Massachusetts, 2003



Site of Death of Massachusetts Residents, Calendar Years 1991-2004



Hospital Discharge Data (HDD)

- Detailed information on all acute care stays in non-VA hospitals in Massachusetts (approximately 850,000 discharges annually)
- Collected for over 20 years
- Over 250 variables for each stay

Study Objectives

- To investigate variation in resource use in terminal care, across age groups, among hospitals
- To explore the factors that may affect variation in resource use
- ***Not*** to study quality of care

Study Data

- This study used patient dispositions of “death” and “discharge to hospice.”
- Previously healthy accident/violence patients were included.

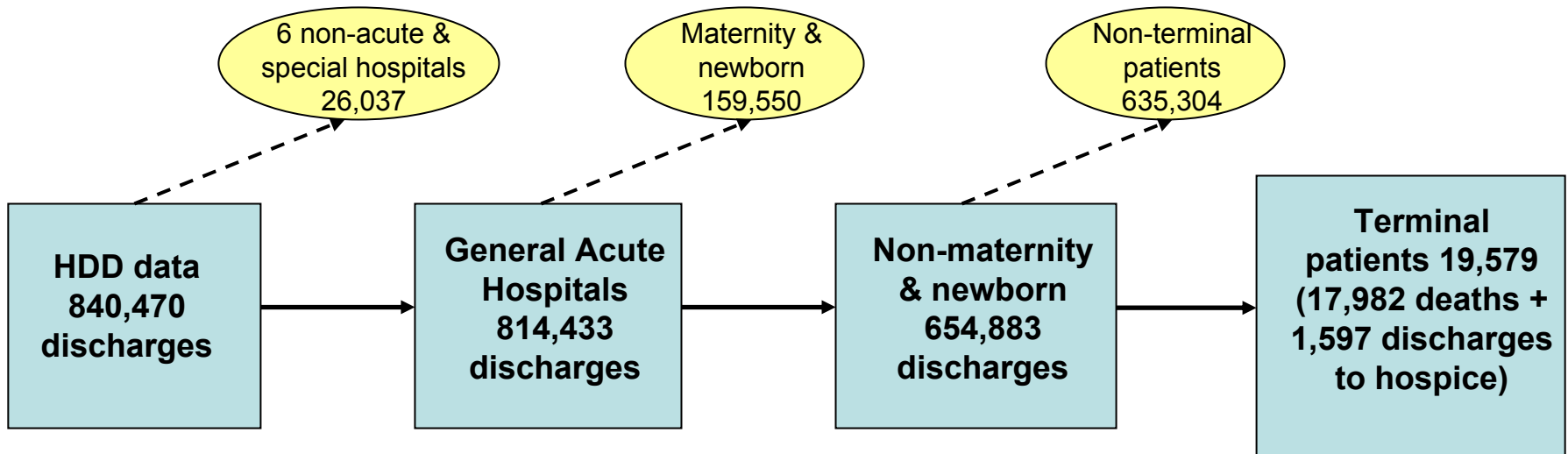
Caveats:

- Obviously, death cannot necessarily be forecast accurately during hospitalization.
- DNR should be noted in HDD, but rarely is.

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Study Population (FY04)



Hospitals excluded: Kindred Hospital North Shore, Kindred Hospital Boston, Caritas Norcap Lodge, Providence Hospital, and Children's Hospital.

VA hospital data are not included in the HDD data.

Study Design (1 of 3 slides)

- To focus on resource use during terminal hospitalizations, identified retrospectively in the Hospital Discharge Data
- To compare resource use between teaching and community hospitals by three age groups: <65, 65-79, and ≥80
- To compare resource use in terminal care among individual hospitals (or hospital campus)
- Study design modeled after Dartmouth Atlas Study

Study Design (2 of 3 slides)

Measures for inpatient resource use:

- ICU use:
 - % of terminal patients with any ICU days
 - % of terminal patients with ICU stay ≥ 7 days
- Significant procedures:
 - % of terminal patients with >3 significant procedures
- Average hospital length of stay (LOS)
- Average total hospital charge per terminal patient

Study Design (3 of 3 slides)

Measures for factors that may affect resource use:

- Demographic factors: age, gender, race
- Type and severity of diseases:
 - Top five primary diagnoses
 - Top five significant procedures
 - Top five DRGs (APR15 DRG)
 - Being transferred from another care setting
 - Case Mix Index (CMI) based on APR15DRG
- ICU bed availability: Ratio of ICU beds to a hospital's total beds

Massachusetts Teaching Hospitals Included in Study, 2004

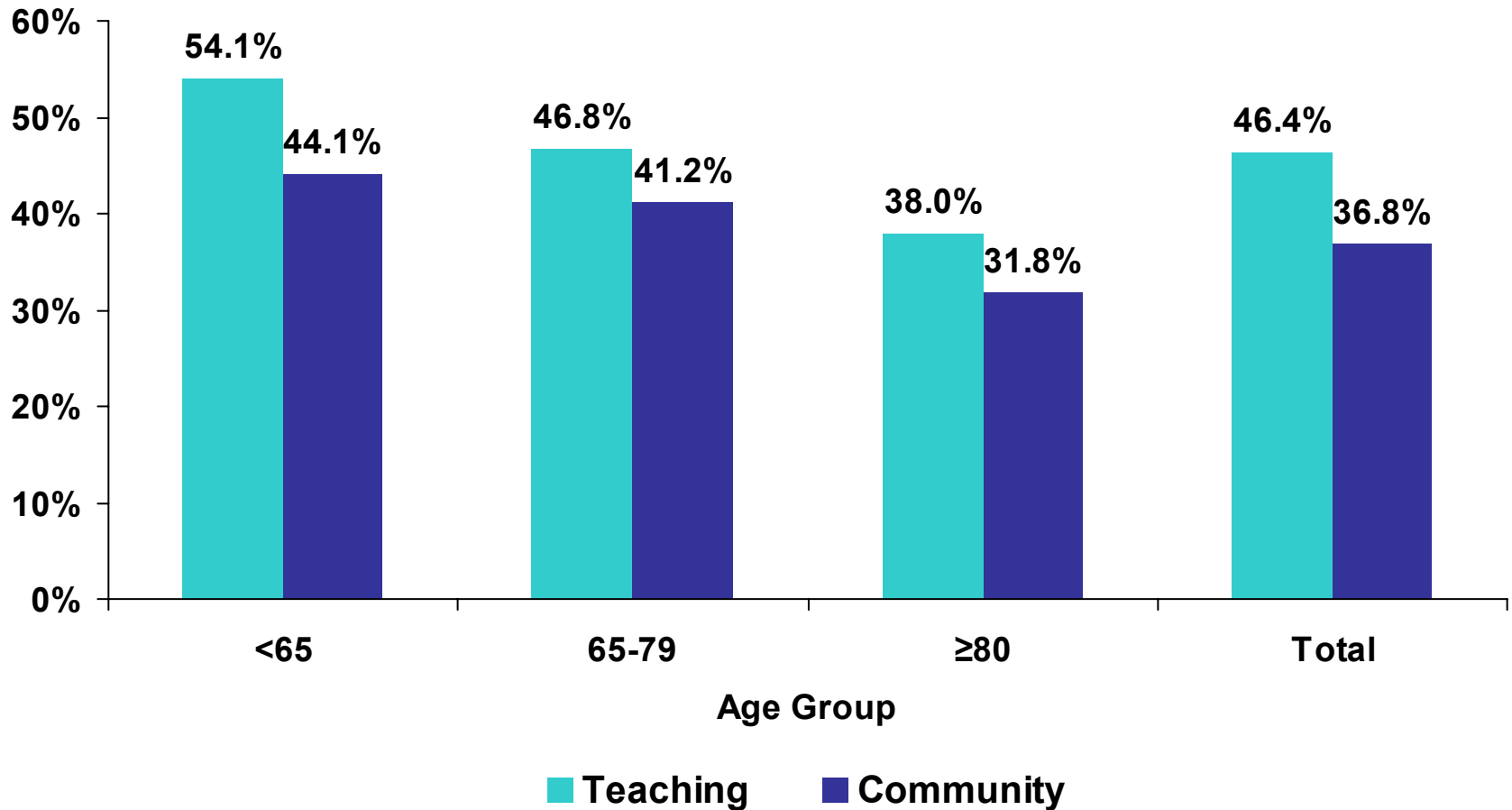
- Baystate Medical Center
- Berkshire Medical Center – Berkshire Campus
- Beth Israel Deaconess Medical Center
- BMC – Harrison Avenue Campus & East Newton Campus
- Brigham and Women's Hospital
- CHA – Cambridge Campus
- Caritas Carney Hospital
- Caritas St. Elizabeth's Medical Center
- Dana Farber Cancer Institute
- Faulkner Hospital
- Lahey Clinic – Burlington
- Massachusetts General Hospital
- Mount Auburn Hospital
- New England Medical Center
- Saint Vincent Hospital at Worcester Medical Center
- UMass Memorial Medical Center – University Campus

Note: 17 teaching hospitals (or campuses) and 59 community hospitals (or campuses).

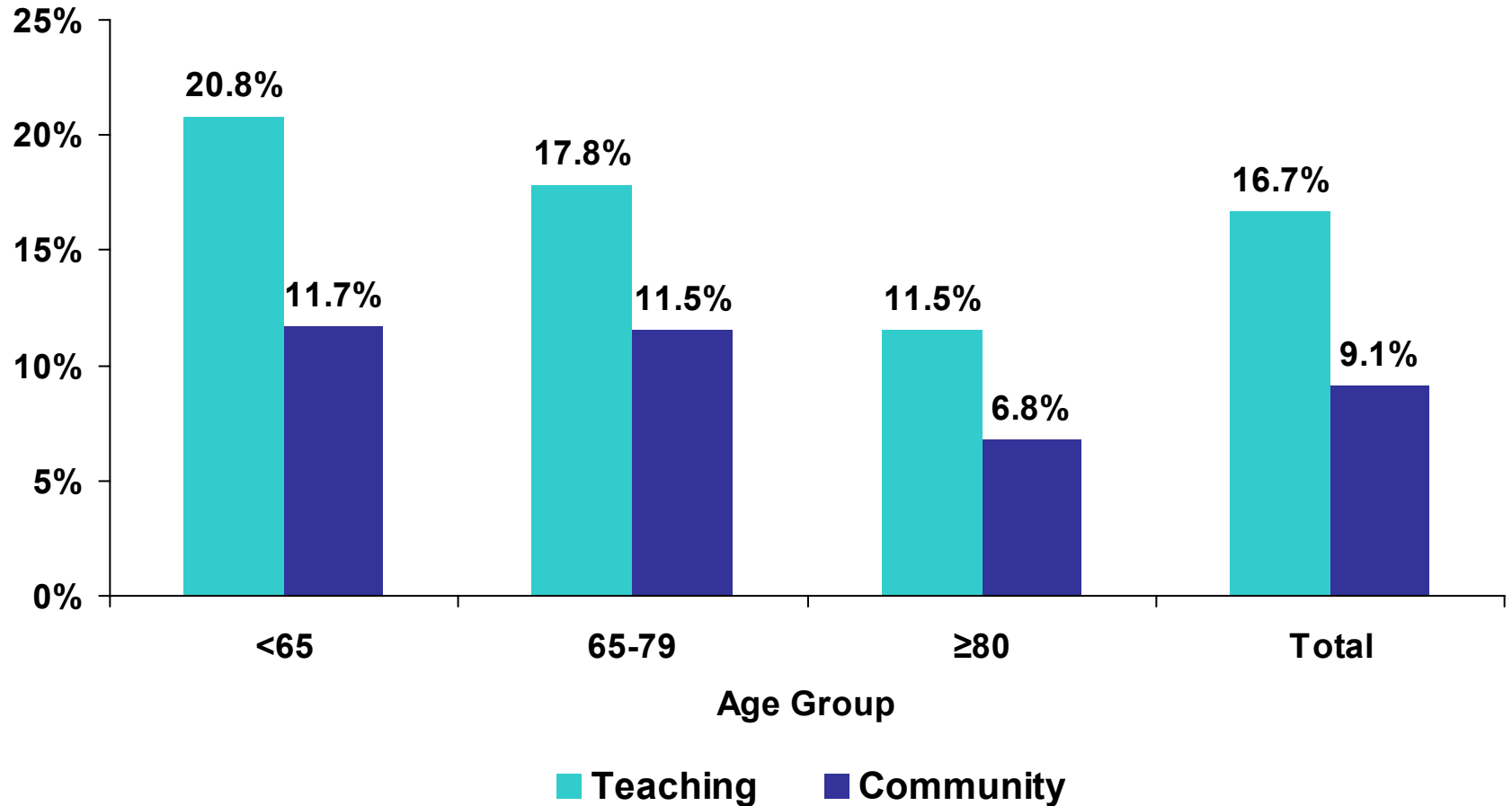
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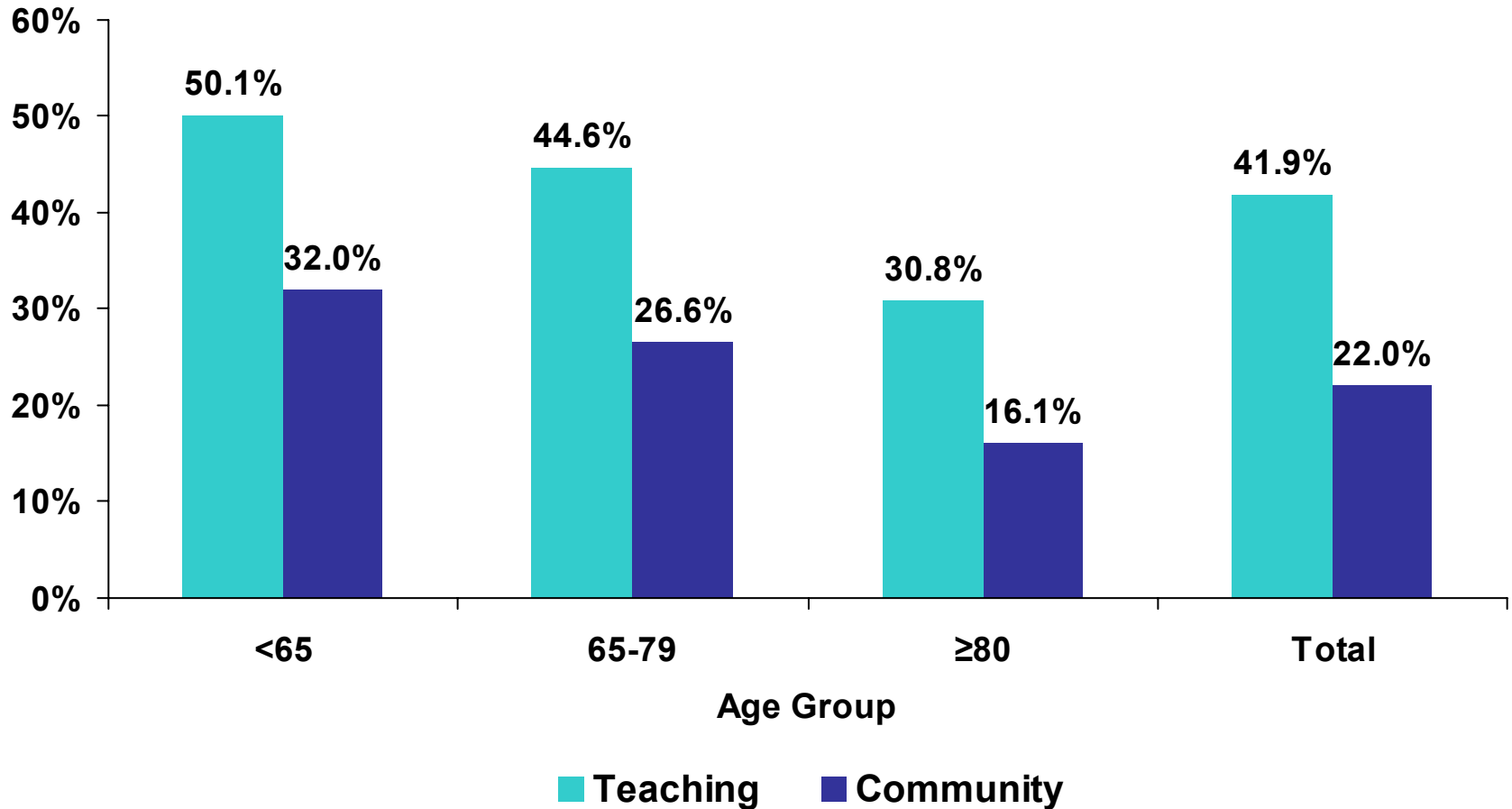
Percent of Terminal Patients with Any ICU Days, by Hospital Type, FY04



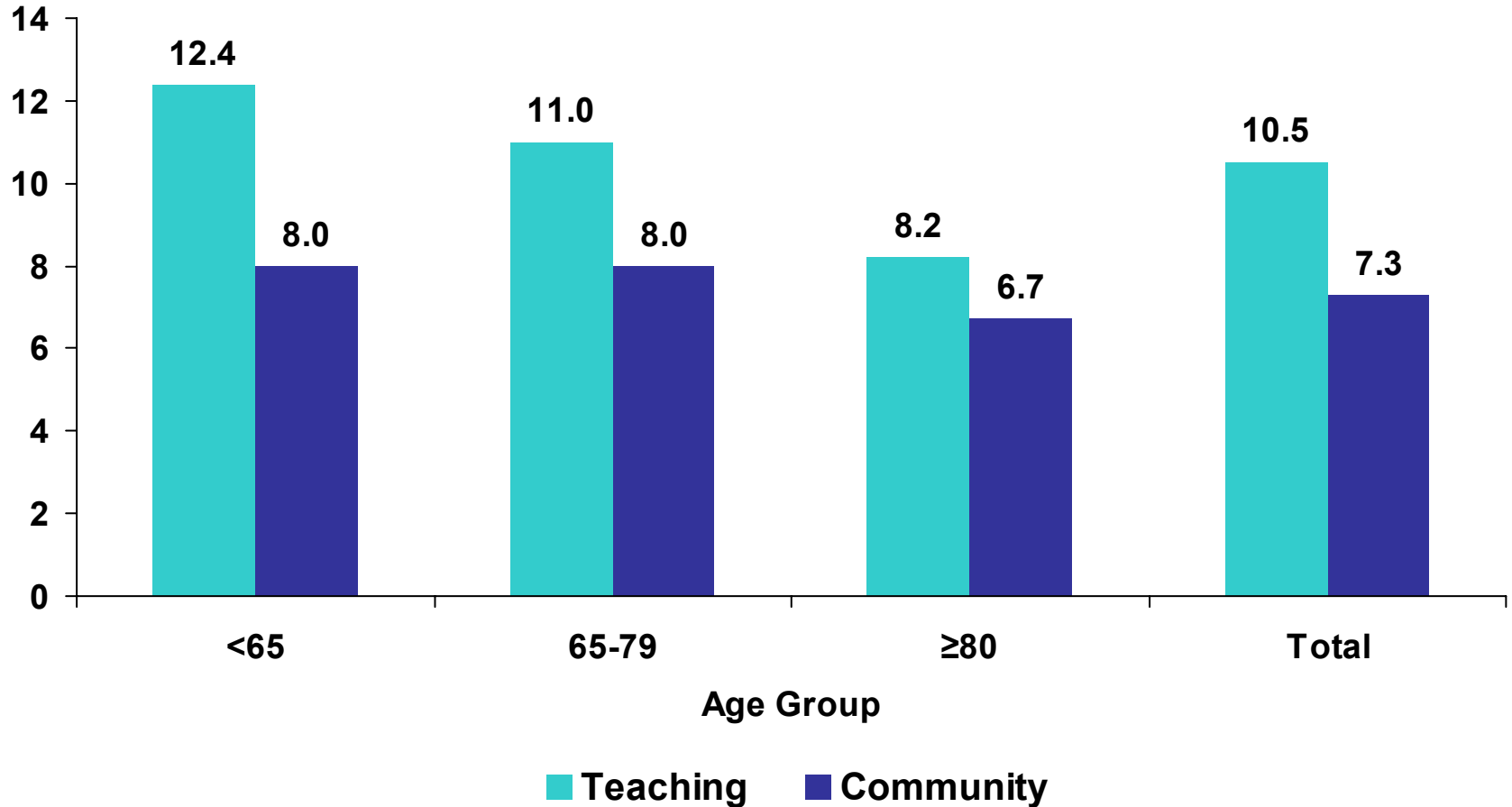
Percent of Terminal Patients with ICU Stay ≥ 7 Days, by Hospital Type, FY04



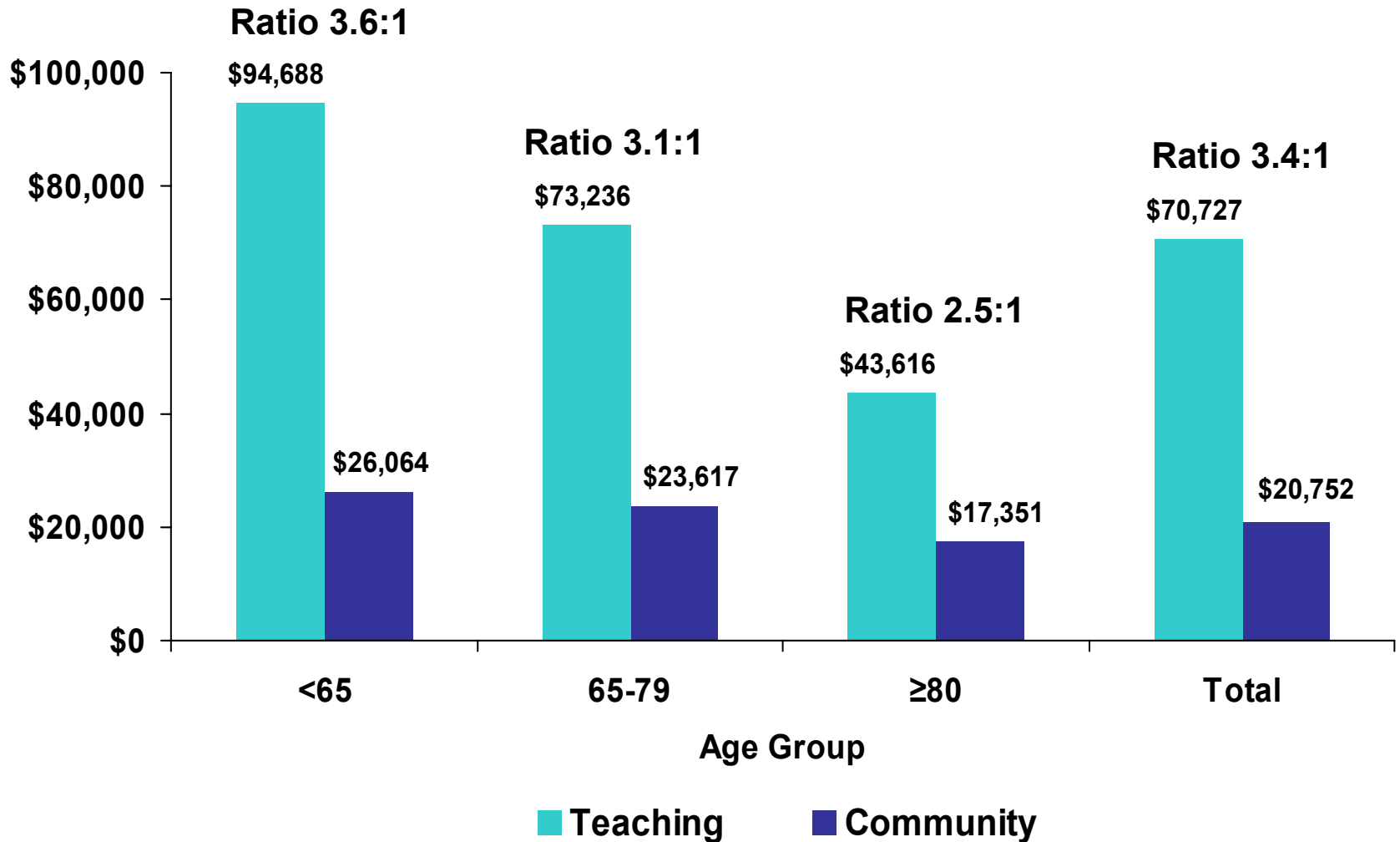
Percent of Terminal Patients with >3 Significant Procedures, by Hospital Type, FY04



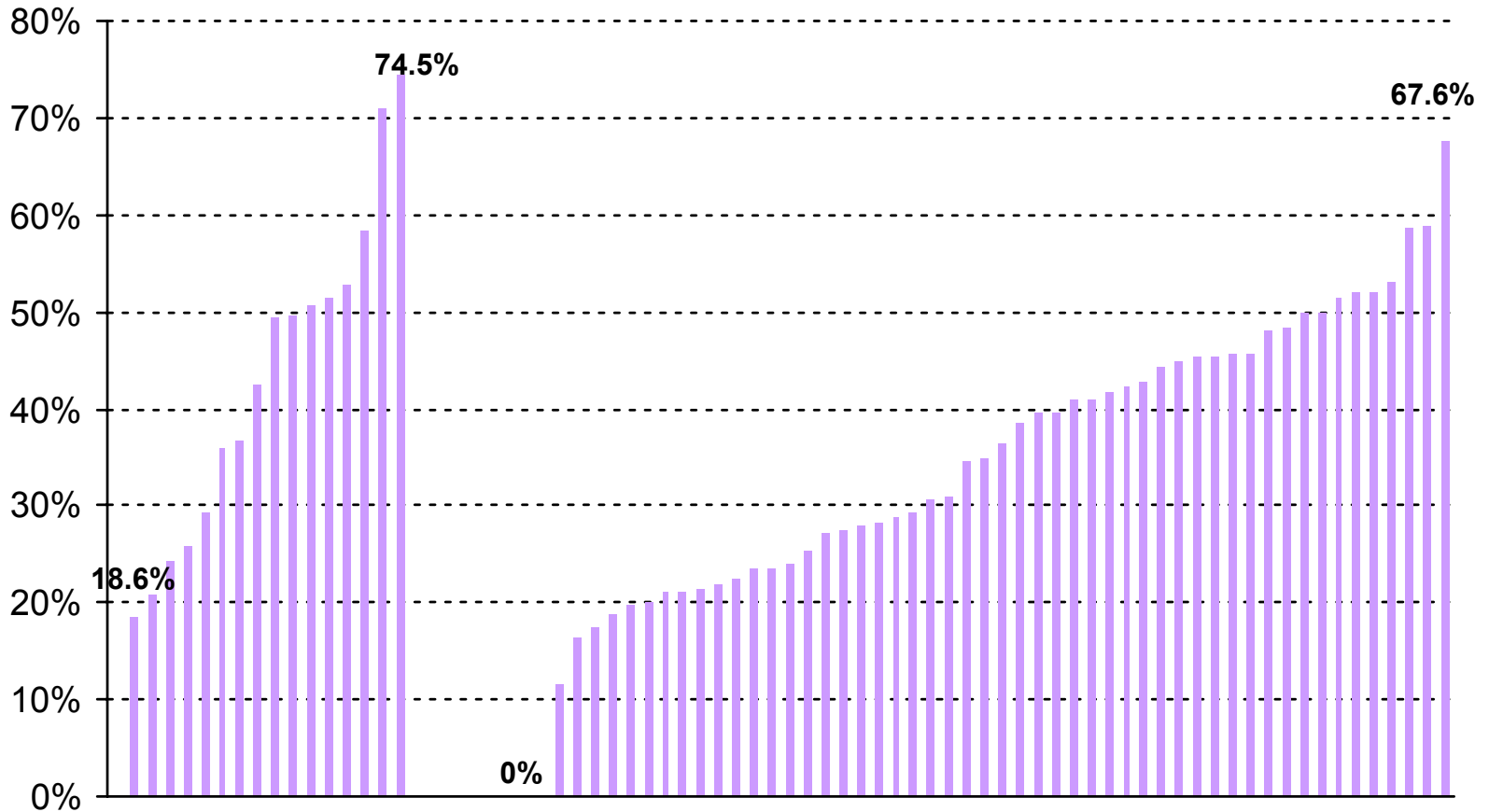
Average LOS (in days) of Terminal Patients, by Hospital Type, FY04



Average Hospital Charge per Terminal Patient, by Hospital Type, FY04



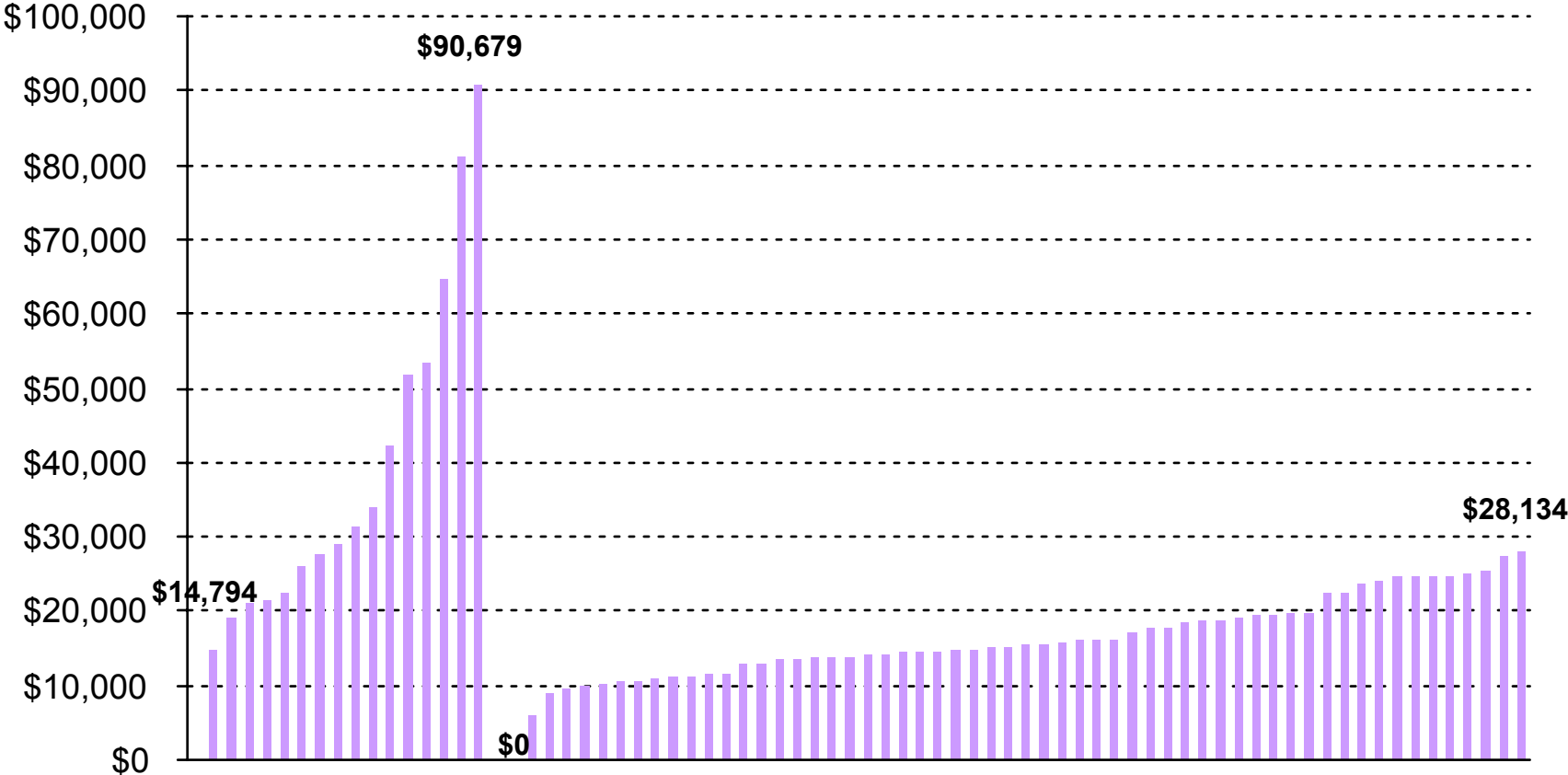
Percent of Terminal Patients \geq Age 80 with Any ICU Days, by Hospital, FY04



Teaching Hospital Average 38%

Community Hospital Average 32%

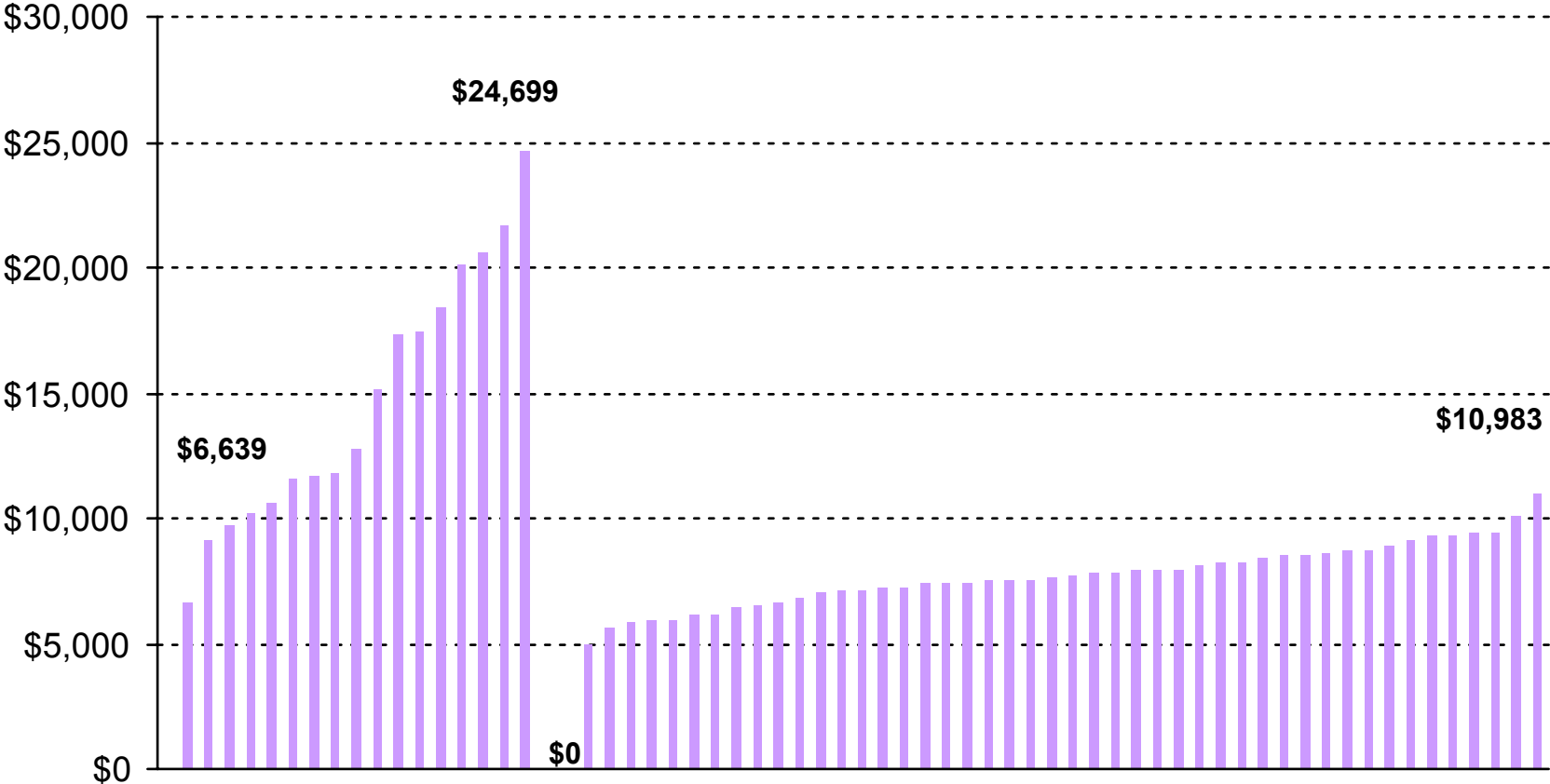
Average Hospital Charge per Terminal Patient \geq Age 80, by Hospital, FY04



Teaching Hospital Average \$43,616

Community Hospital Average \$17,351

Medicare Hospital Payment per Terminal Patient by Hospital, FY04



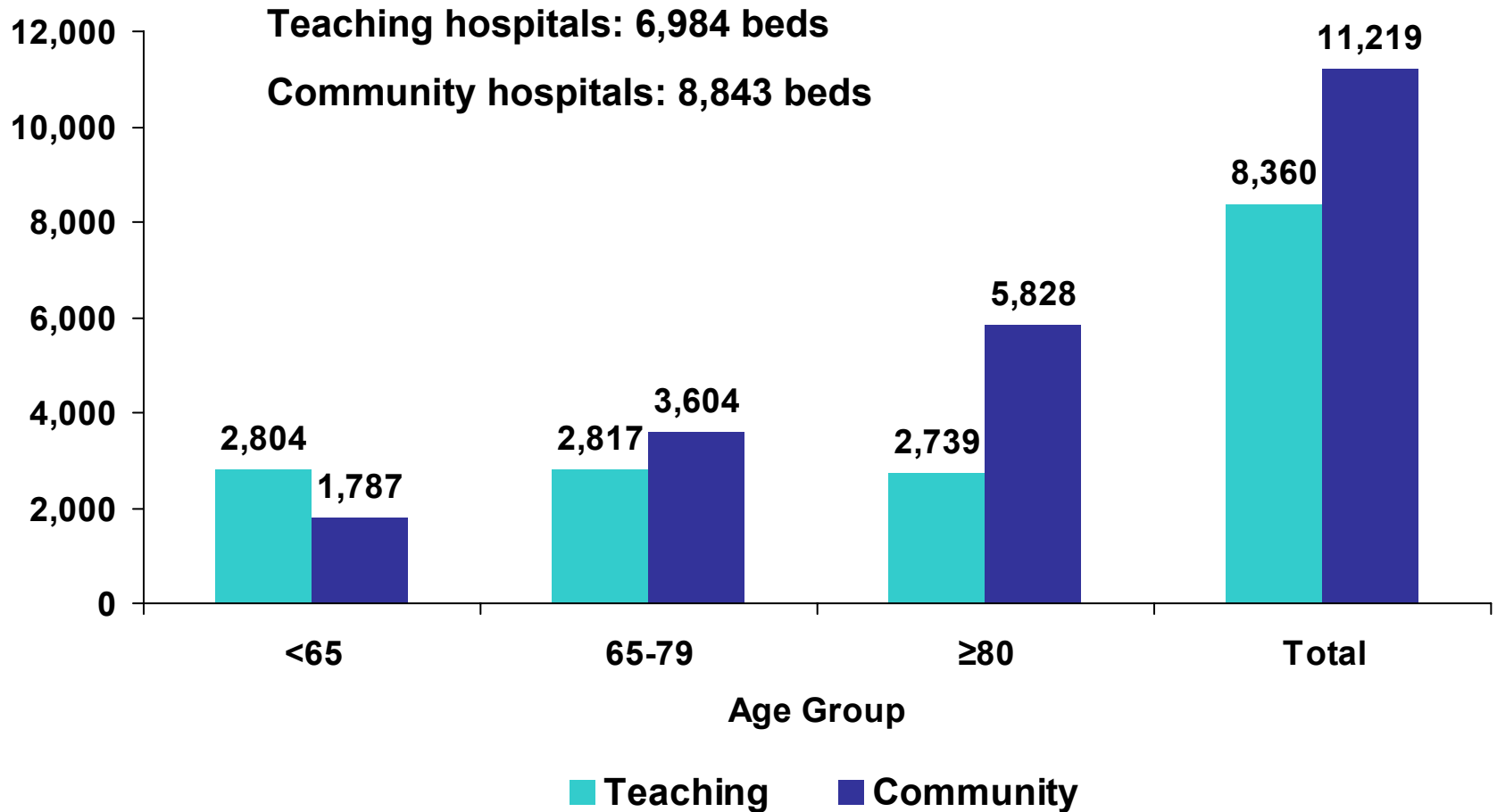
Teaching Hospital Average \$15,828

Community Hospital Average \$8,044

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Number of Terminal Patients, by Hospital Type, FY04



Demographics of Terminal Hospital Patients

	Teaching	Community	Total
Age: <65	33.5%	15.9%	23.4%
65-79	33.7%	32.1%	32.8%
≥80	32.8%	51.9%	43.8%
Sex: female	48.6%	53.2%	51.2%
male	51.4%	46.8%	48.8%
Race: white	82.2%	94.6%	89.3%
non-white	17.8%	5.4%	10.7%
Total	8,360 (100%)	11,219 (100%)	19,579 (100%)

Top Five Primary Diagnoses of Terminal Patients, by Hospital Type, FY04

Teaching Hospitals			Community Hospitals		
Primary Diagnosis	Number of Cases	Percent of Total	Primary Diagnosis	Number of Cases	Percent of Total
5070	308	3.7%	486	874	7.8%
4280	307	3.7%	4280	651	5.8%
486	301	3.6%	5070	642	5.7%
0389	288	3.4%	51881	596	5.3%
51881	277	3.3%	0389	523	4.7%
Total	1,481	17.7%	Total	3,286	29.3%

DX 486: Pneumonitis, organism unspecified; **DX 0389:** Unspecified septicemia; **DX 4280:** CHF;
DX 5070: Pneumonitis due to inhalation of food or vomitus; **DX 51881:** Respiratory failure.

Top Five Significant Procedures of Terminal Patients, by Hospital Type, FY04

Teaching Hospitals			Community Hospitals		
Significant Procedure	Number of Cases	Percent of Total	Significant Procedure	Number of Cases	Percent of Total
9671	688	8.2%	9671	1,072	9.2%
9672	407	4.9%	9904	540	4.8%
9604	394	4.7%	3893	505	4.5%
3893	296	3.5%	9672	503	4.5%
9904	192	2.3%	9604	389	3.5%
Total	1,977	23.6%	Total	2,964	26.4%

3893: Venous catheterization, not elsewhere classified; **9604:** Insertion of endotracheal tube;

9671: Continuous mechanical ventilation for <96 consecutive hours;

9672: Continuous mechanical ventilation for 96 consecutive hours or more; **9904:** Transfusion of packed cells.

Top Five DRGs of Terminal Patients, by Hospital Type, FY04

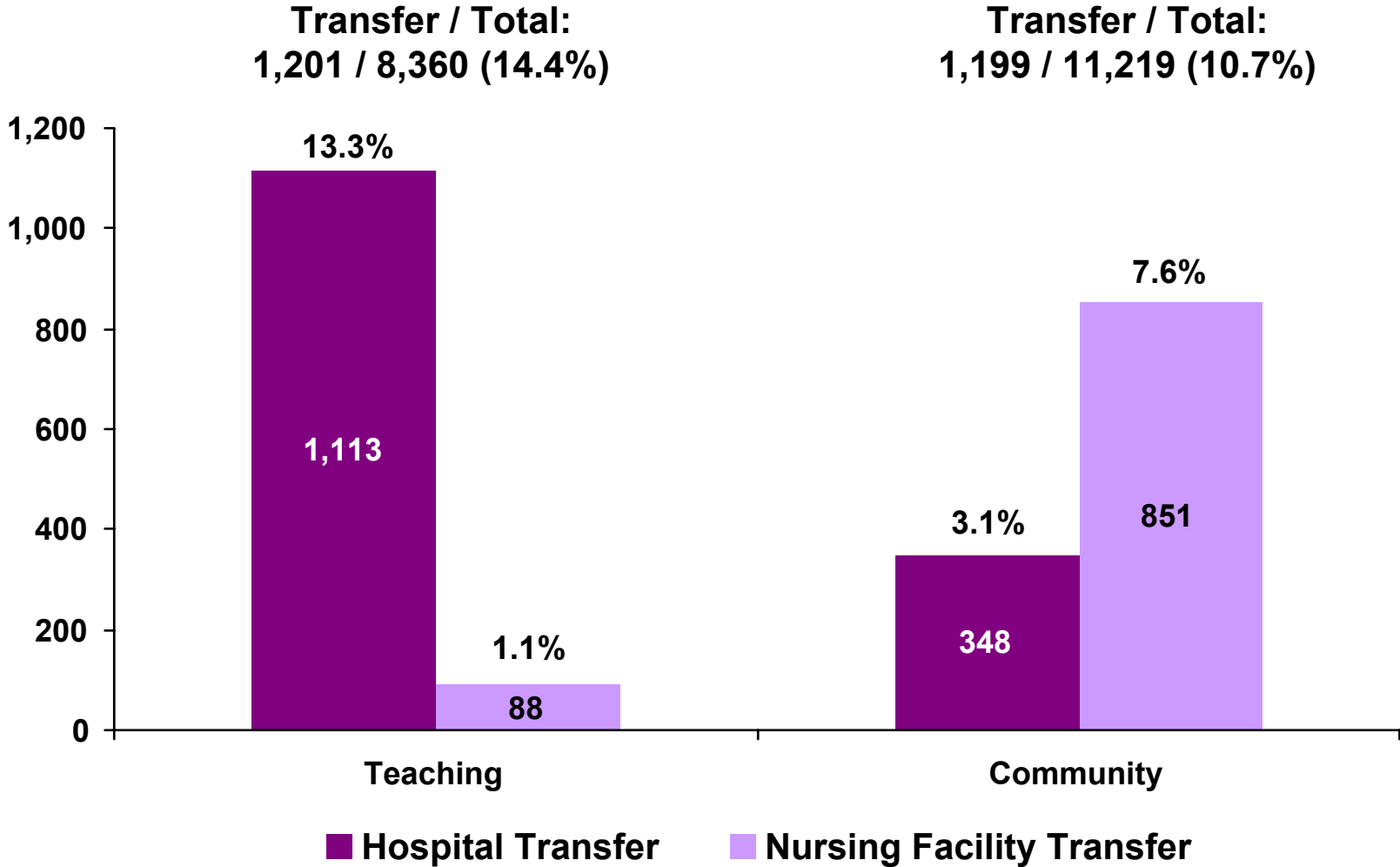
Teaching Hospitals			Community Hospitals		
APR15DRG	Number of Cases	Percent of Total	APR15DRG	Number of Cases	Percent of Total
720	477	5.7%	139	836	7.5%
190	340	4.1%	720	804	7.2%
137	333	4.0%	190	726	6.5%
136	302	3.6%	137	668	6.0%
4	290	3.5%	194	622	5.5%
Total	1,742	20.8%	Total	3,656	32.6%

DRG 4: Tracheotomy except for face, mouth & neck diagnoses; **DRG 136:** Respiratory malignancy;

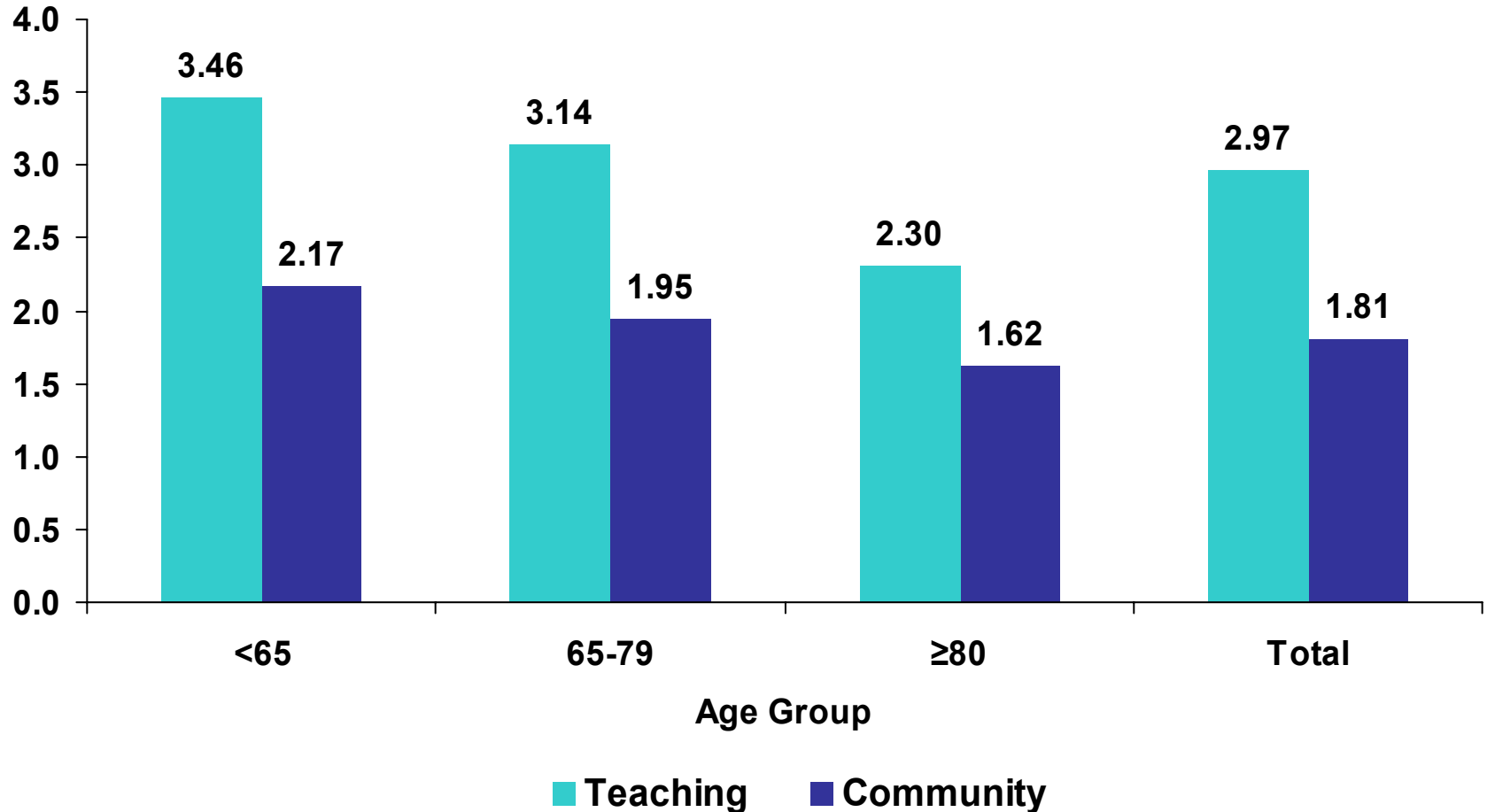
DRG 137: Respiratory infections & inflammations; **DRG 139:** Simple pneumonia;

DRG 190: Circulatory disorder w AMI; **DRG 194:** Heart failure; **DRG 720:** Septicemia.

Terminal Patients Transferred from Another Hospital or Nursing Facility, FY04



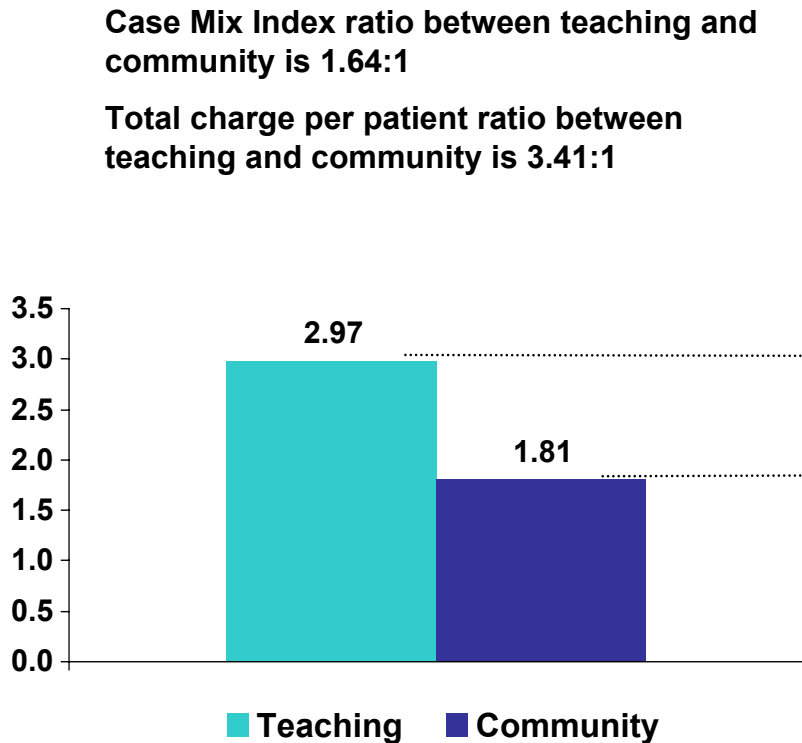
Case Mix Index (CMI) of Terminal Patients, by Hospital Type, FY04



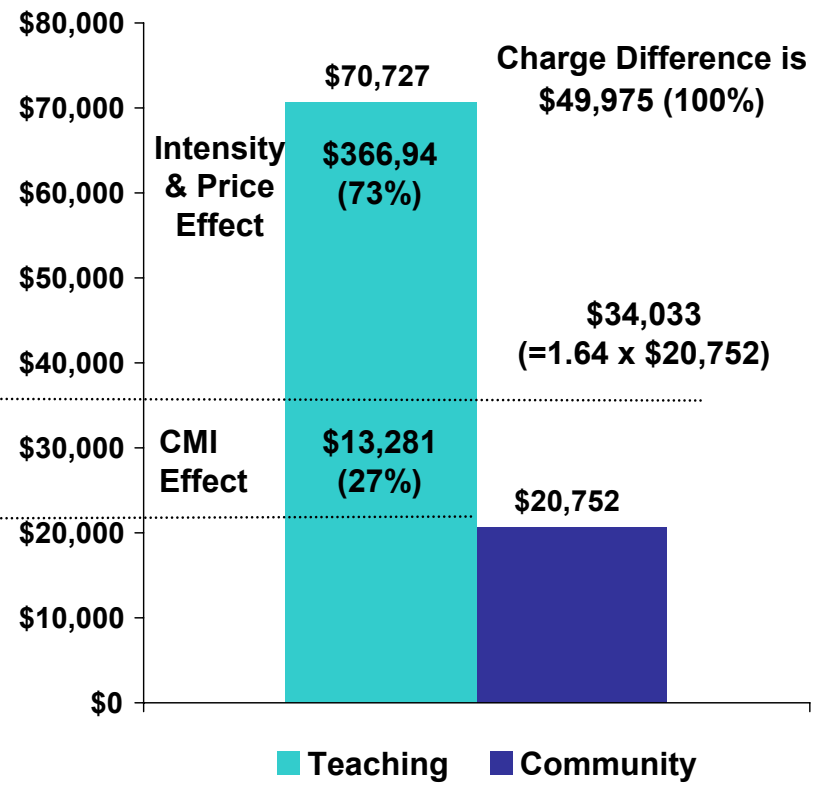
Case Mix Index is based on APR15 DRG.

Differences between Teaching and Community Hospitals in CMI and Charges, FY04

Case Mix Index



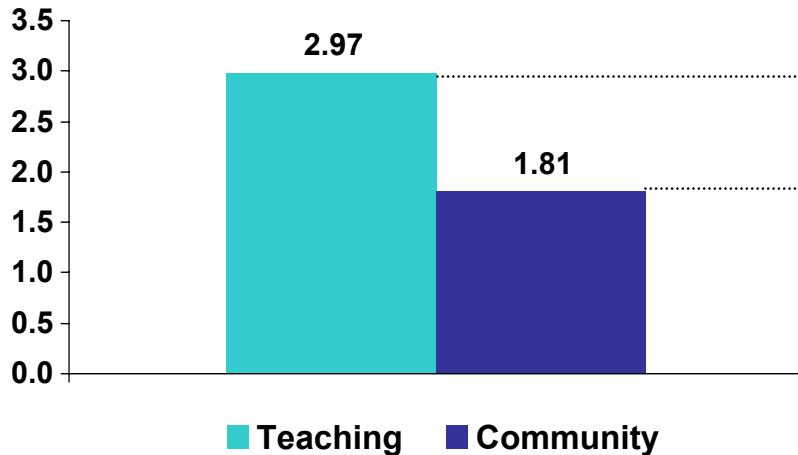
Total Hospital Charge per Case



Differences between Teaching and Community Hospitals in CMI and Medicare Payment, FY04

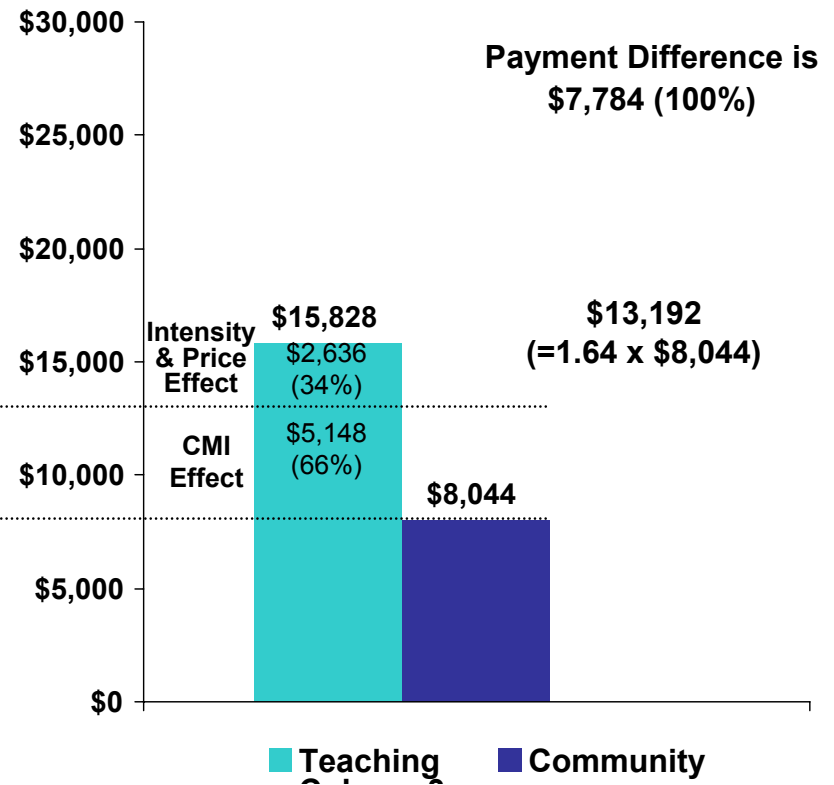
Case Mix Index

1.64:1 between teaching and community hospitals

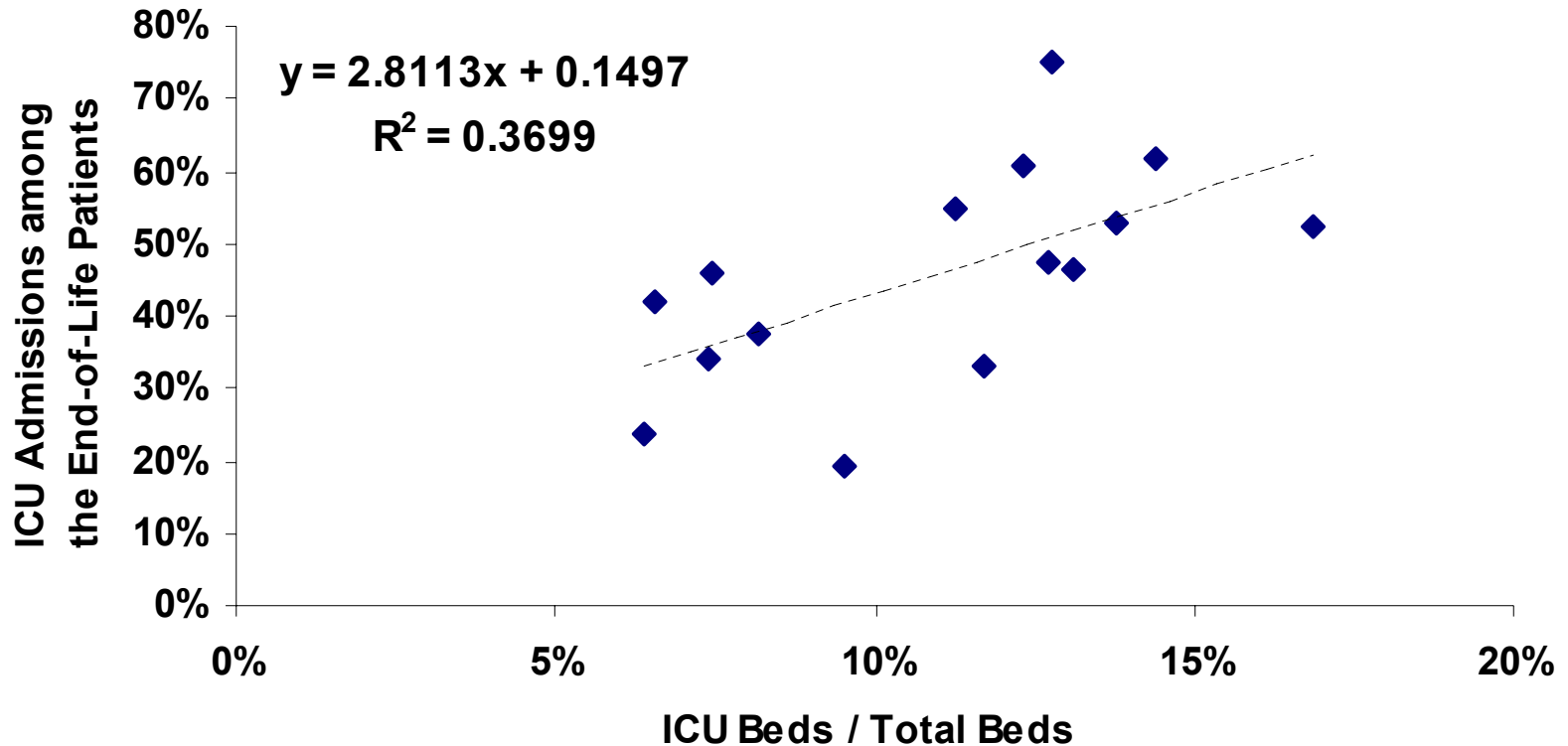


Medicare Payment per Case

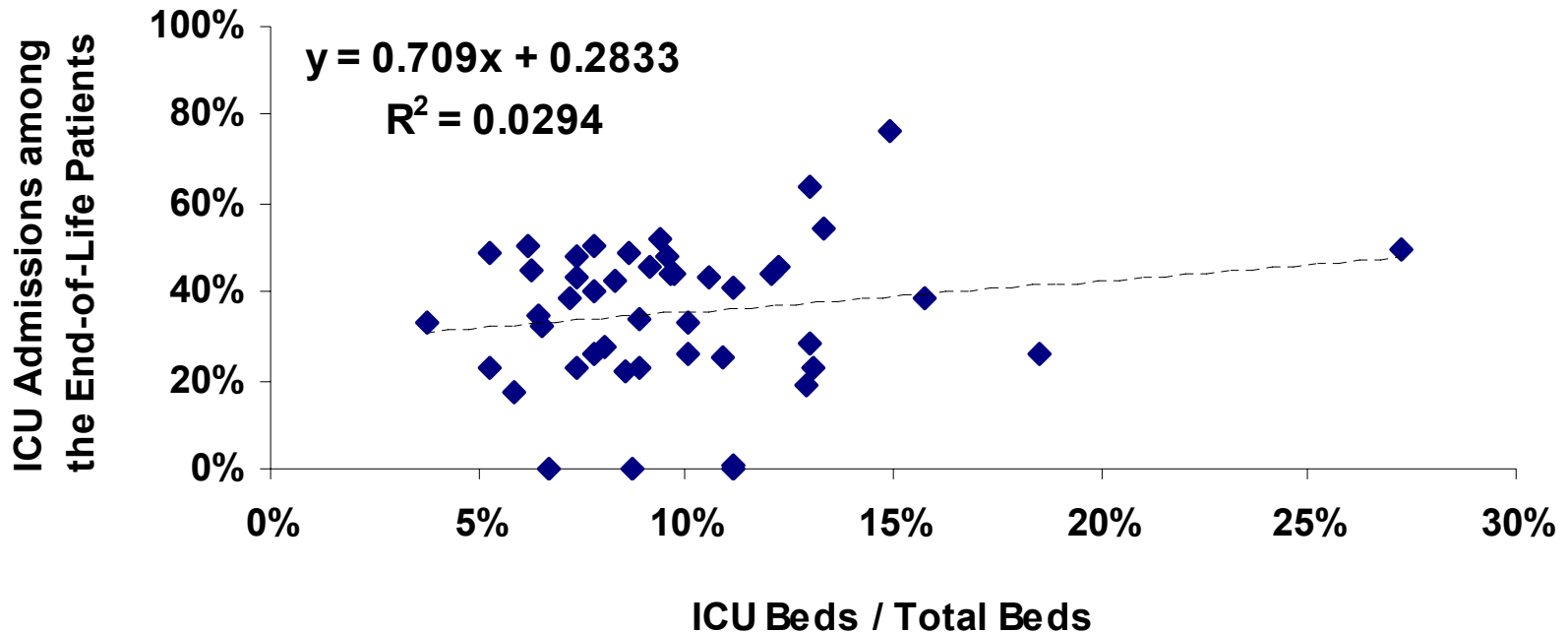
1.97:1 between teaching and community hospitals



ICU Bed Ratio & ICU Admissions of Terminal Patients among Teaching Hospitals, FY04



ICU Bed Ratio & ICU Admissions of Terminal Patients among Community Hospitals, FY04



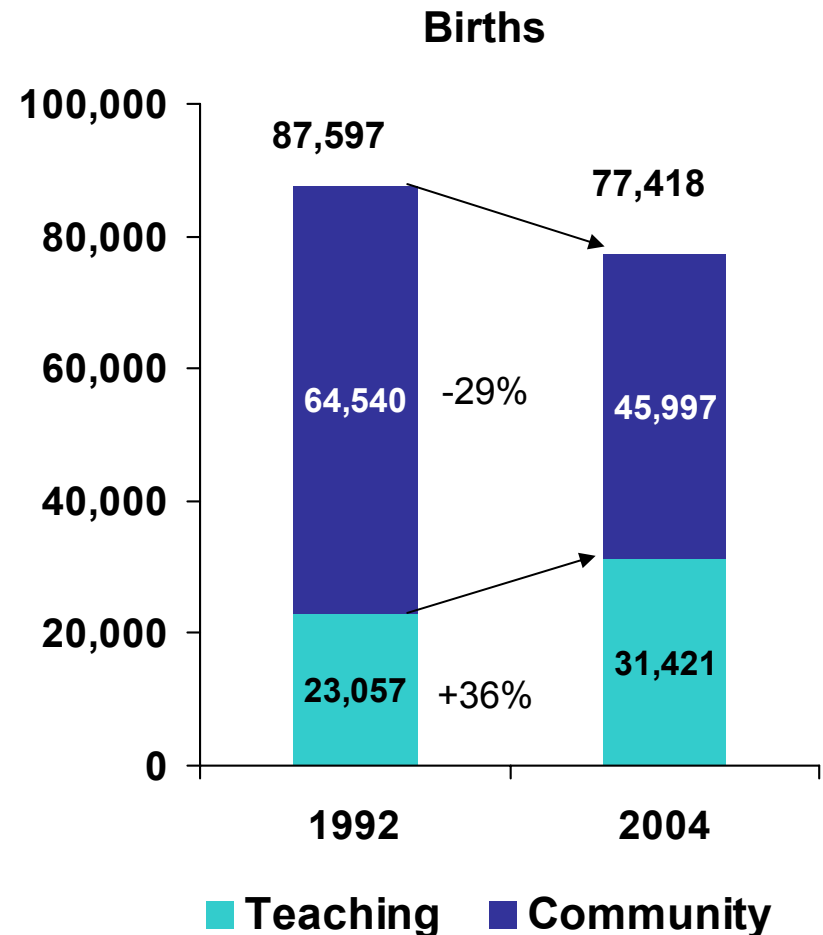
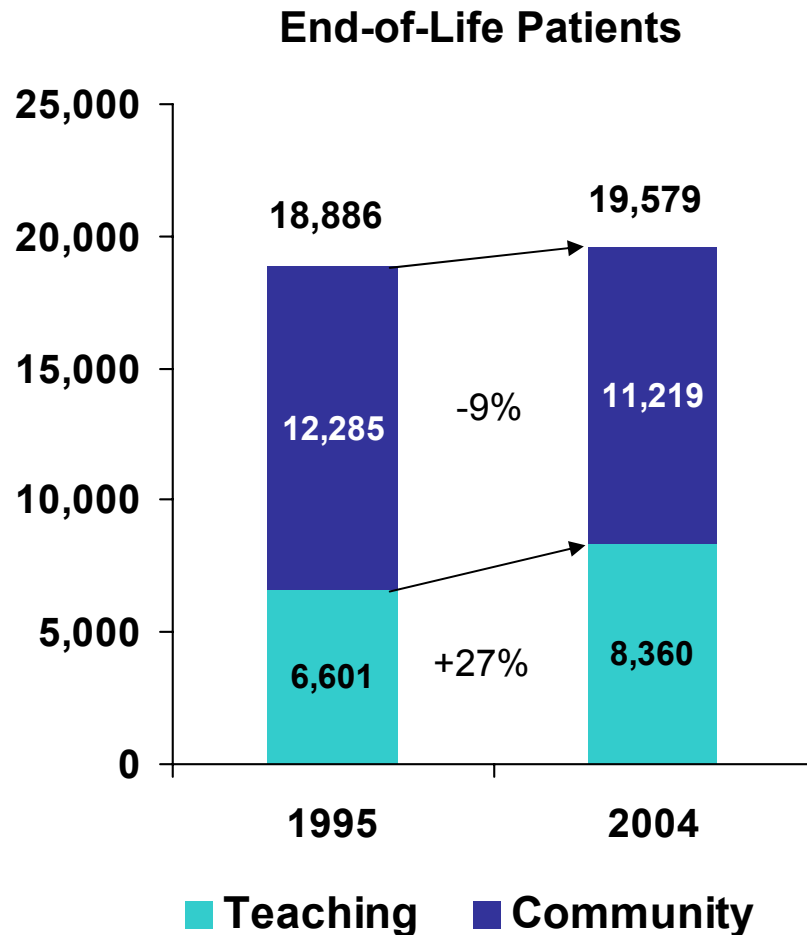
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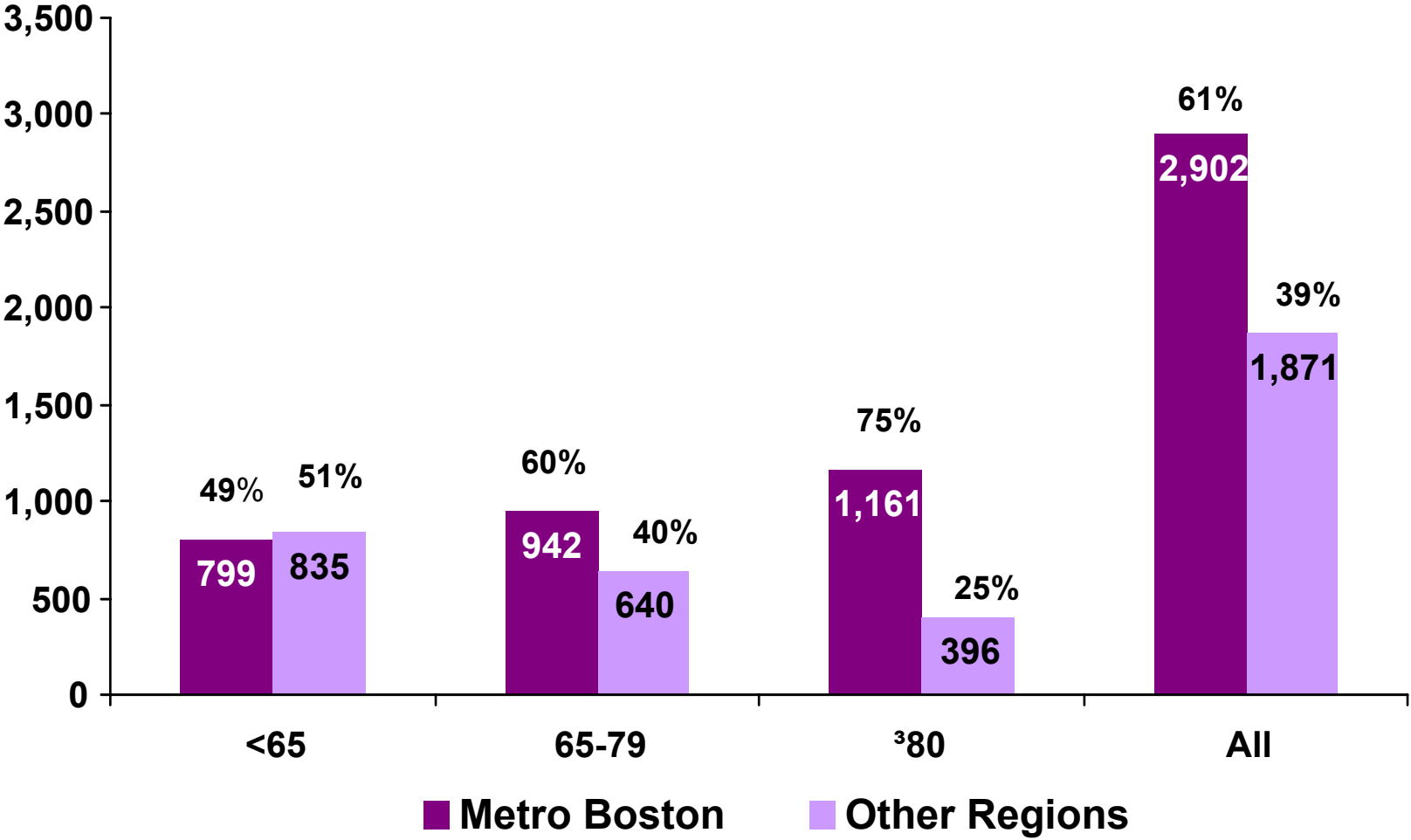
Study Conclusions

- Teaching hospitals tend to treat EOL patients with substantially more resources than community hospitals, even after controlling for patient age and disease severity, but this does not account for patient preference.
- Resource use in EOL care varies substantially, even across hospitals that share the same teaching status.
- The availability of ICU beds among teaching hospitals tends to lead to a higher rate of ICU use.

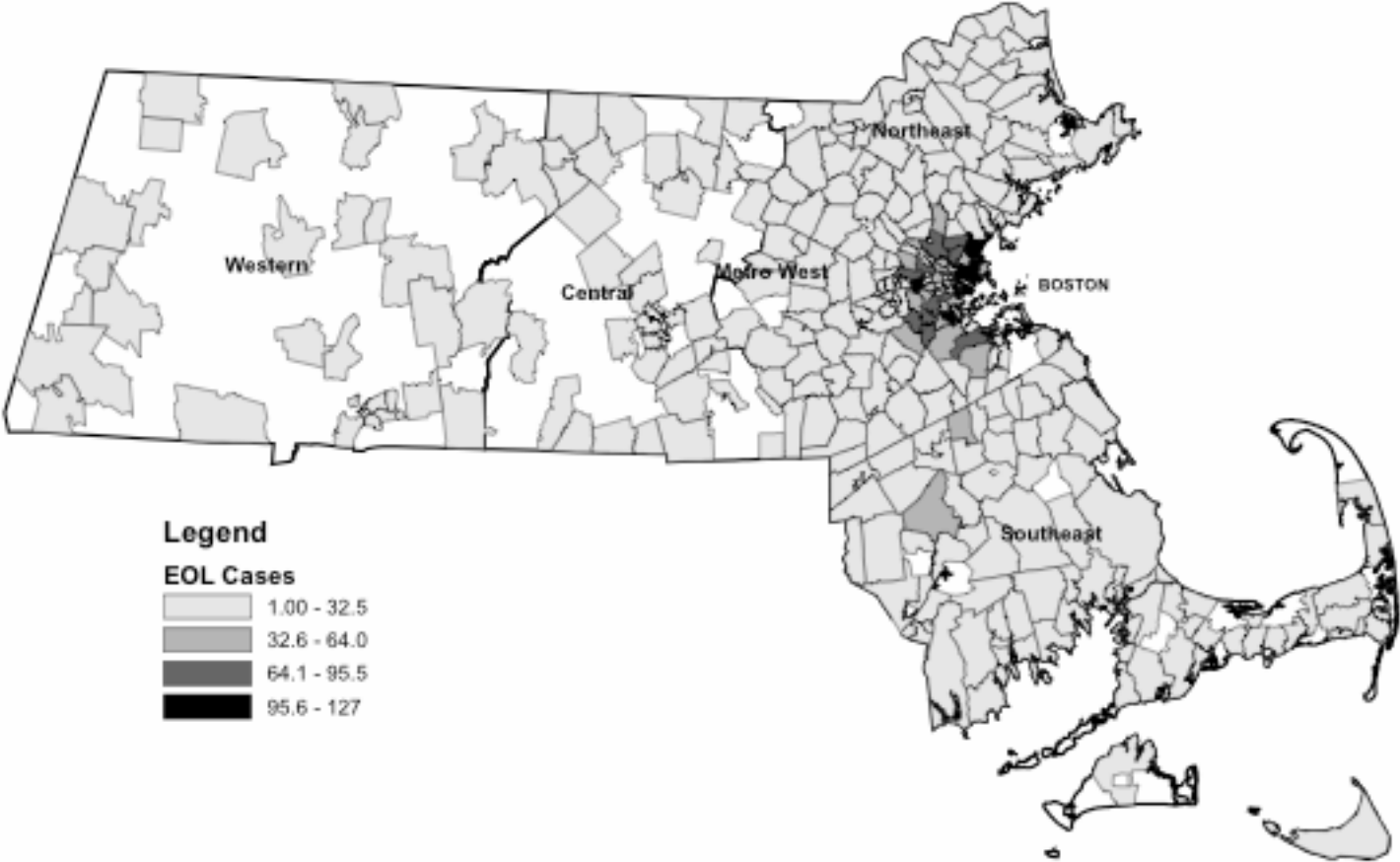
Trend of Patient Movement from Community to Teaching Hospitals in Massachusetts



Region of Residence of Terminal Patients at Metro Boston Teaching Hospitals, FY04



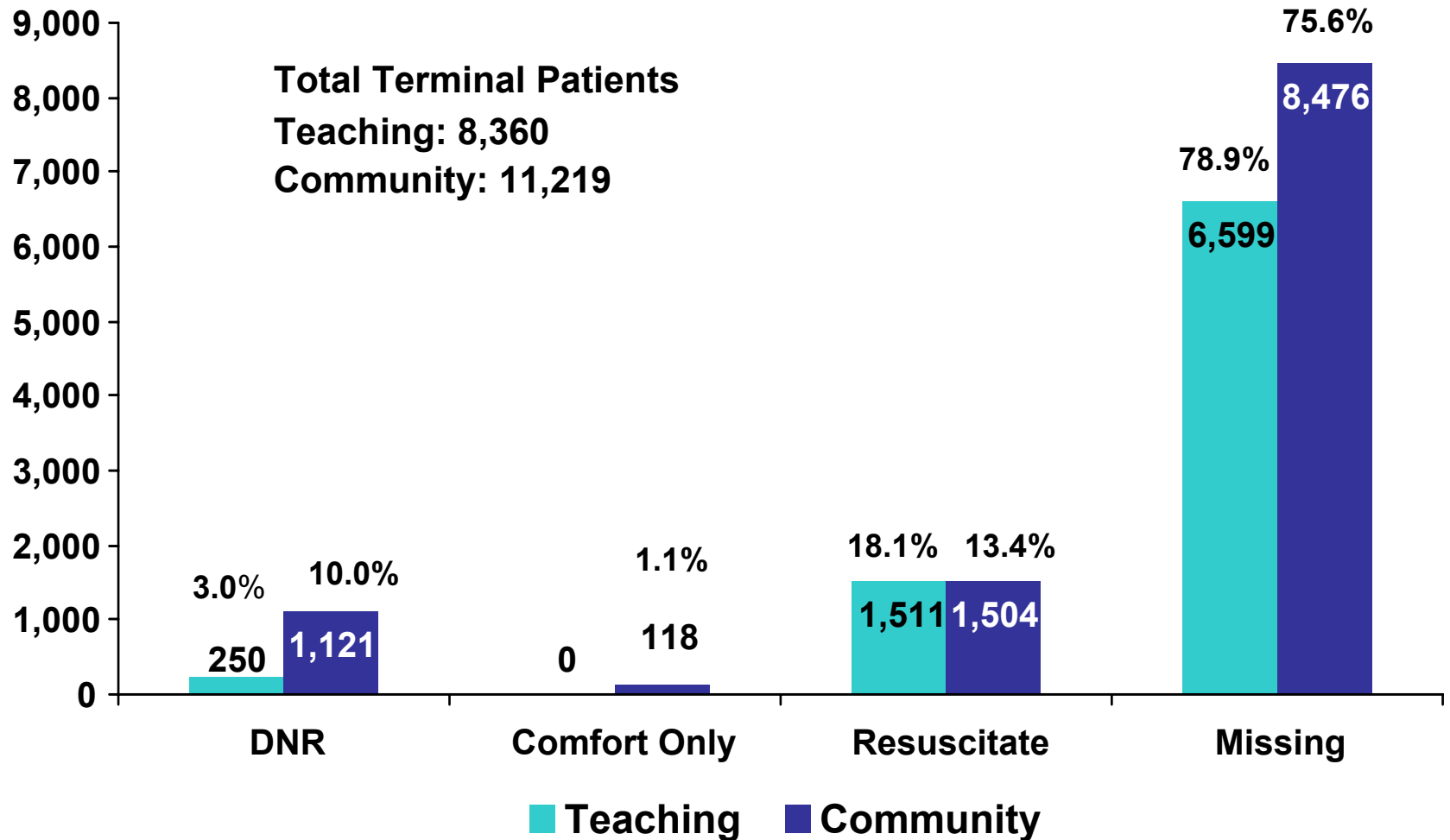
Residence of Terminal Patients at Metro Boston Teaching Hospitals, FY04



Study Limitations

- Administrative data may not contain sufficient information to fully adjust for differences in patient severity and, especially, patient preference.
- A patient's last stay may reflect an incomplete picture of EOL resource use.
- Resource use patterns are influenced by both providers and patients (and family members).
- Some hospitalizations that ultimately are terminal are not obviously so throughout.

Data Issue: Do Not Resuscitate (DNR) Status, by Hospital Type, FY04



Massachusetts Division of Health Care Finance and Policy

www.mass.gov/dhcfp

See Policy Analysis or Data Catalog

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