

INTRODUCTION

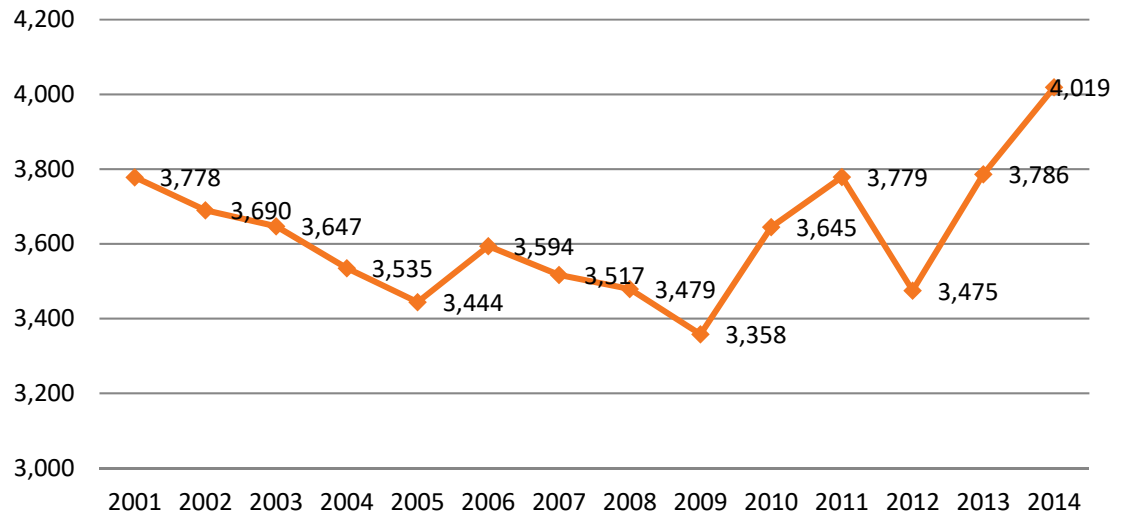
Currently, 1.9 million people are living with limb loss in the United States (1). An estimated 185,000 amputations are performed each year (2). The number of people living with limb loss is expected to double by the year 2050 due to increasing rates of diabetes and vascular disease (3). Among those living with limb loss, the major causes of amputation are vascular disease (54%) – including diabetes and peripheral arterial disease – trauma (45%) and cancer (less than 2%) (4). The most common causes of pediatric amputations, however, are lawn mower accidents (5). Non-whites comprise about 42% of the limb loss population in the U.S. (3). In 2008, the diabetes related amputation rate among African Americans was nearly four times that of whites (6).

A total of 3,786 amputations were performed in Tennessee hospitals in 2014. These amputations were performed for a variety of reasons, including diabetes. The following information highlights the trends and most current rates of amputation and diabetes in Tennessee.

1. AMPUTATION TRENDS OVER TIME

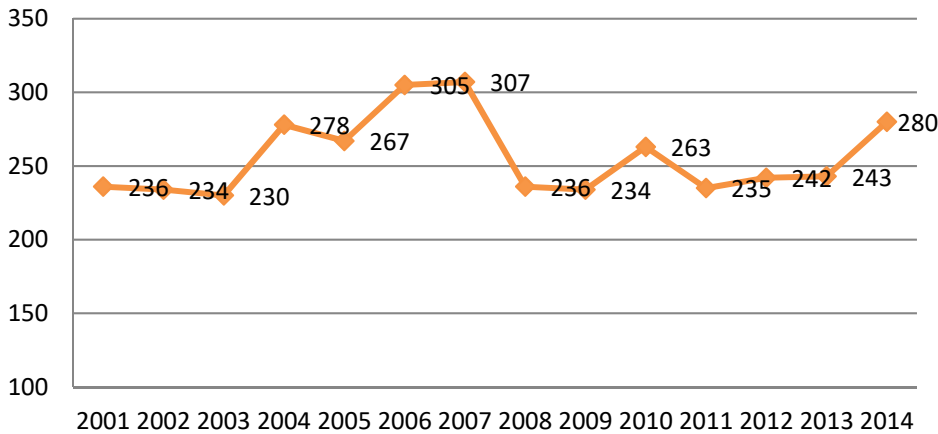
Graph 1.1: Amputation Trends, Tennessee (2001-2014)

There was an overall 6.38% increase in total amputations performed in Tennessee from 2001-2014 according to hospital discharge data. A total of 46,727 amputation procedures were performed in this time period. The lowest incidence of amputation (3,358) was in 2009. After dropping to 3,475 in 2012, the incidence of amputation climbed to 4,019 in 2014. (See Graph 1.1)



Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

Graph 1.2: Upper-Extremity Amputation Trends, Tennessee (2001-2014)

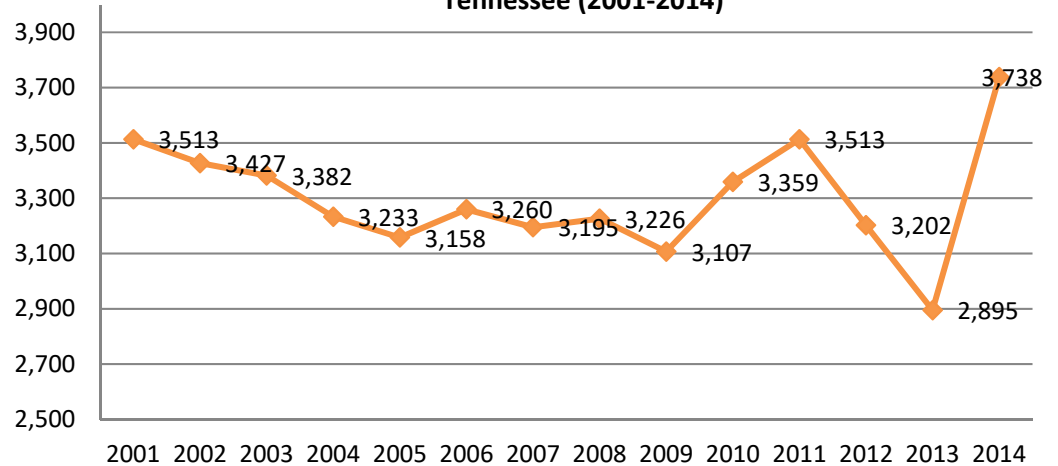


The number of upper-extremity amputations performed each year increased 18.64% from 2001 to 2014. A total of 3,590 upper-extremity amputation procedures were performed in this time period. The lowest incidence of these amputations (230) occurred in 2003, while 2007 saw the most upper-extremity amputations (307). (See Graph 1.2)

Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

Graph 1.3: Lower-Extremity Amputation Trends, Tennessee (2001-2014)

The number of lower-extremity amputations performed each year increased 6.40% from 2001 to 2014. A total of 46,208 lower-extremity amputation procedures were performed in this time period. The lowest incidence of these amputations (3,107) occurred in 2009. After the highest incidence year in 2011 (3,513), lower-extremity amputation procedures had been steadily declining until 2014 with 3,738 amputation procedures and another peak in frequency. (See Graph 1.3)

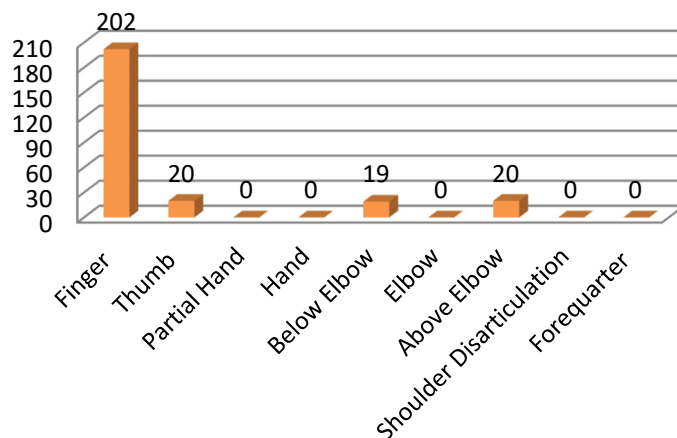


Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

2. TYPES OF AMPUTATIONS PERFORMED

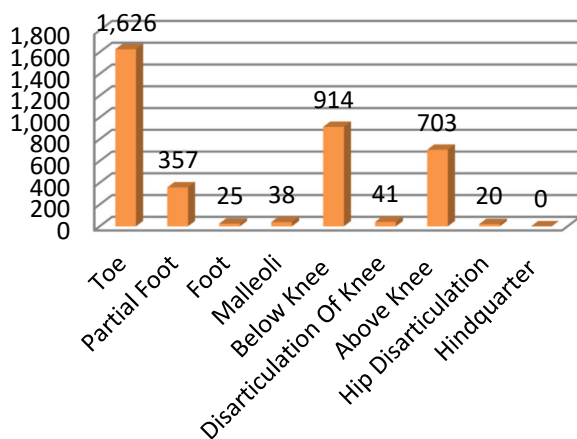
There were 261 upper-extremity amputations were performed in 2014. The most common minor upper-extremity amputations were of the fingers (202) and the most common major upper-extremity procedures were above the elbow (20). (See Graph 2.1)

Graph 2.1: Upper-Extremity Amputations, Tennessee (2014)



Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

Graph 2.2: Lower - Extremity Amputations, Tennessee (2014)



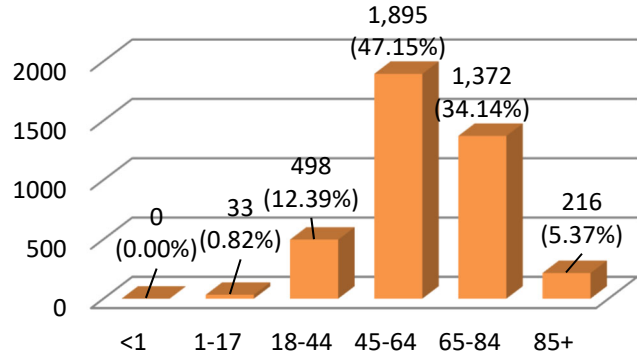
In 2014, 3,724 lower-extremity amputations were performed. Amputations of the toes (1,626) were the most frequent minor lower extremity amputation type. Below (914) and above (703) the knee were the most common major lower extremity amputation procedures. (See Graph 2.2)

Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

3. WHO LOSES A LIMB?

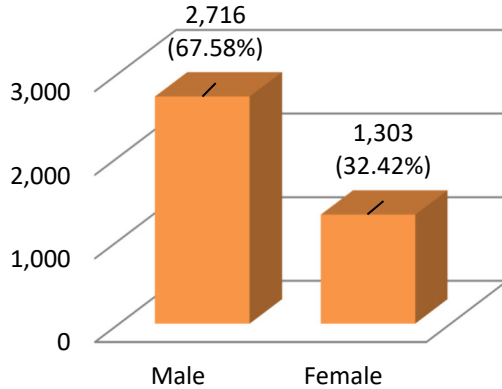
In 2014, most amputations were performed on individuals aged 45-64 years old, followed by the age group of 65-84 year olds (See Graph 3.1).

Graph 3.1: Amputations by Age Group, Tennessee (2014)



Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

Graph 3.2: Amputations by Sex, Tennessee (2014)

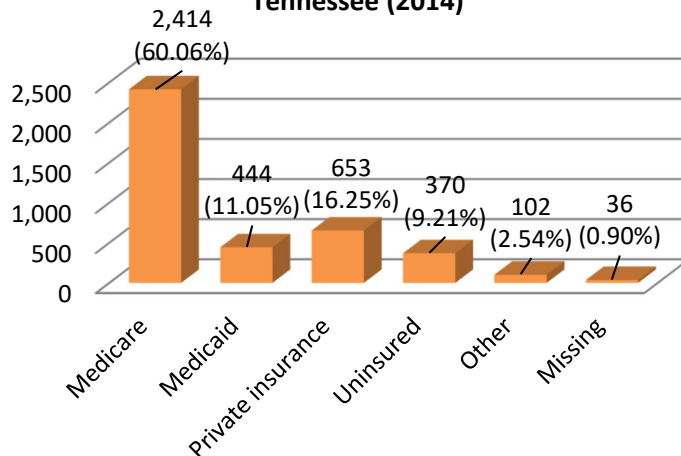


The amputation rate among males was twice that of females (See Graph 3.2).

Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

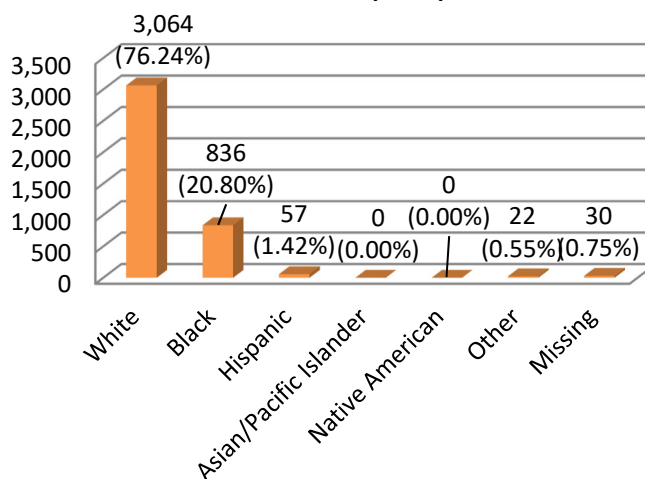
Medicare recipients ranked as the most common group to have an amputation procedure (See Graph 3.3).

Graph 3.3: Amputation by Payer Type, Tennessee (2014)



Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

Graph 3.4: Amputation by Race/Ethnicity, Tennessee (2014)



In 2014, 76.24% of amputation procedures were performed on Whites. However, African-Americans experienced 20.80% of the amputation procedures performed in 2014 despite comprising 16.8% of the population of the state of Tennessee.

Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

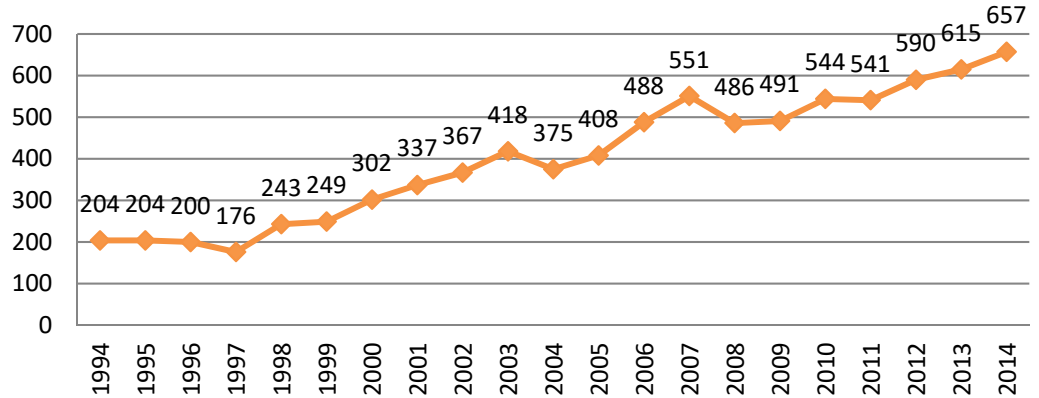
Source: <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

4. DIABETES TRENDS

Diabetes is a leading cause of lower-extremity amputations.

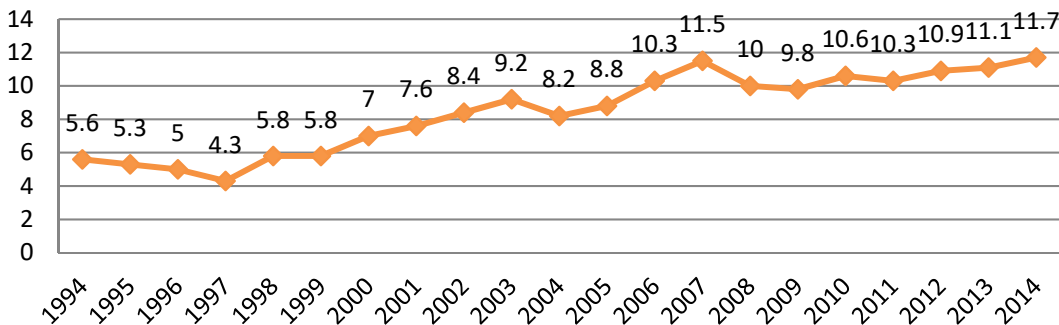
In 2014, a total of 657,979 Tennesseans indicated that they had been diagnosed with diabetes at some point in their lives. The prevalence of diabetes in the adult population of Tennessee increased 222.06 % from 1994 to 2014. (See Graph 4.1)

Graph 4.1: Total Diabetes Trends (per 1,000 Adults; age 18+), Tennessee (1994 - 2014)



Source: CDC Behavioral Risk Factor Surveillance System <https://gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html>

Graph 4.2: Yearly Rates of Diagnosed Diabetes per 100 Adults (age 18+), Tennessee (1994 - 2014)



The annual rate of existing cases of diabetes among adults in Tennessee increased 108.93% from 1994 to 2014. (See Graph 4.2)

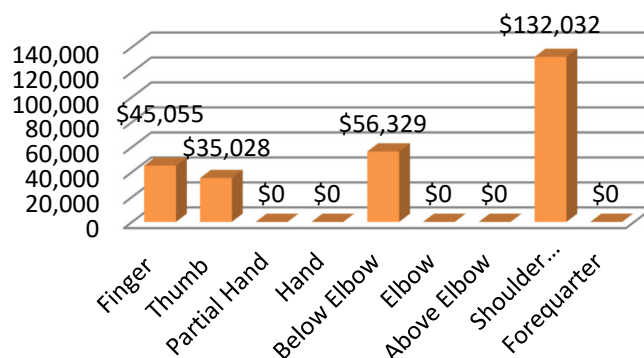
Source: CDC Behavioral Risk Factor Surveillance System <https://gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html>

5. HEALTHCARE COSTS

For persons with a unilateral lower-extremity amputation, the two year healthcare costs, including initial hospitalization, inpatient rehabilitation, outpatient physical therapy, and purchase and maintenance of a prosthetic device, is estimated to be \$91,106. The lifetime healthcare cost for persons with a unilateral lower extremity amputation is estimated to be more than \$500,000 (7). It is anticipated that these healthcare costs would be higher for a person with a proximal amputation level and bilateral amputation status, due to higher prosthetic costs

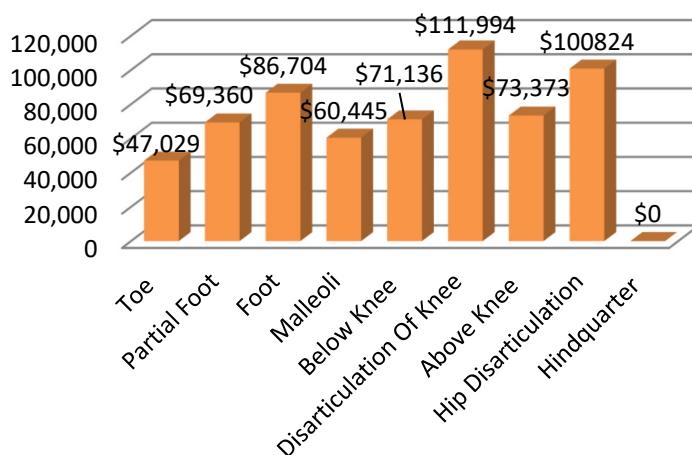
Charges represent what the hospital billed for the case, and may not represent all discharges for amputations. (See graph 5.1)

5.1: Overall Hospital Charges for Upper Extremity Amputations, Tennessee, 2014



Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

5.2: Overall Hospital Charges for Lower Extremity Amputations, Tennessee, 2014



Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

Charges represent what the hospital billed for the case, and may not represent all discharges for amputations. (See graph 5.2)

6. REFERENCES

1. Ziegler-Graham K, MacKenzie EJ, Ephraim PL, Travison TG, Brookmeyer R. Estimating the prevalence of limb loss in the United States: 2005 to 2050. *Arch Phys Med Rehabil*2008 Mar;89(3):422-9.
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