

INTRODUCTION

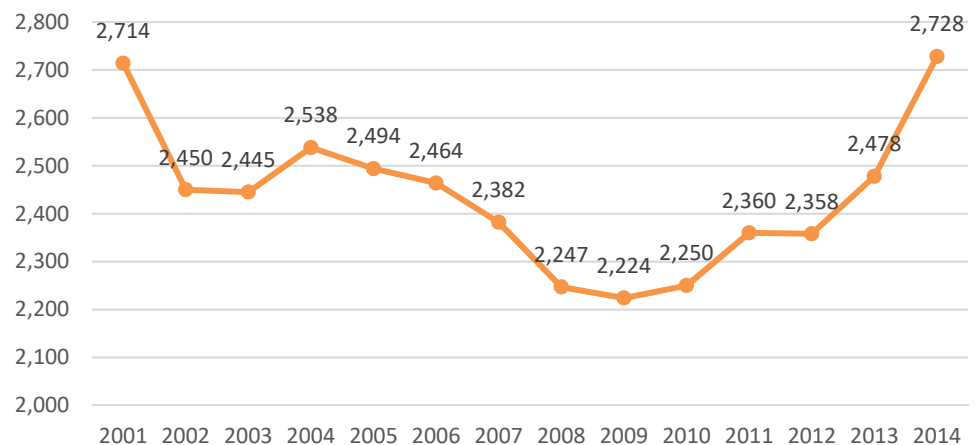
Currently, 1.9 million people are living with limb loss in the United States, with an average of 507 people continuing to lose a limb every day. This results in an estimated 185,000 amputations per year (1), and this number is expected to double by the year 2050 due to increasing rates of diabetes and vascular disease (1). Among those living with limb loss, the major causes of their amputations are vascular disease (54%) – including diabetes and peripheral arterial disease – trauma (45%) and cancer (less than 2%) (2). The most common causes of pediatric amputations, however, are lawn mower accidents (3). Non-whites comprise about 42% of the limb loss population in the U.S. (1). In 2008, the diabetes related amputation rate among African Americans was nearly four times that of whites (4).

A total of 2,728 amputations were performed in Wisconsin hospitals in 2014. These amputations were performed for a variety of reasons, including diabetes and peripheral arterial disease complications. The following information details the trends and most current rates of amputation and diabetes in Wisconsin.

1. AMPUTATION TRENDS OVER TIME

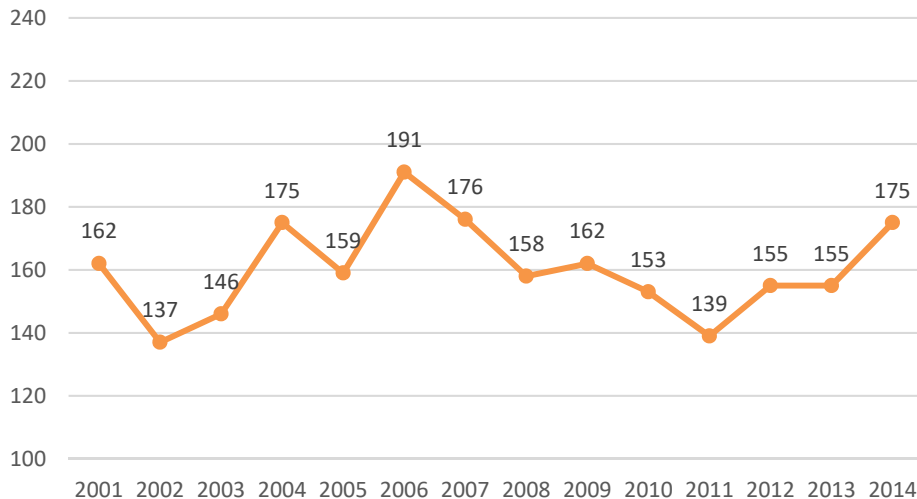
According to hospital discharge data, the number of total amputations performed in Wisconsin was at a low in 2009 (2,224) and a high in 2014 (2,728). This overall time period represents a 0.52% increase. A total of 34,132 amputations were performed in this time period. (See Graph 1.1)

1.1: Amputation Trends, Wisconsin (2001-2014)



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

1.2: Upper-Extremity Amputations, Wisconsin (2001-2014)

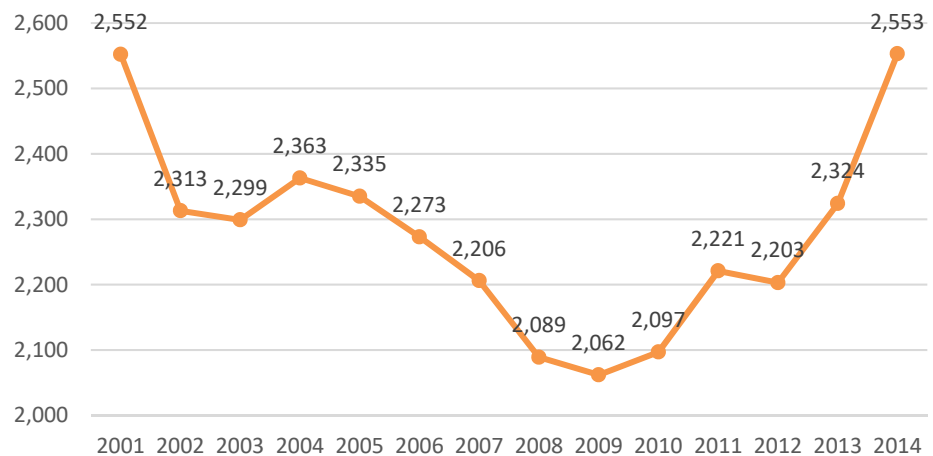


In Wisconsin, the total number of upper-extremity amputations performed from 2001 to 2014 was 2,243. The year 2006 saw the most of these types of amputations (191), while the lowest incidences (137) occurred in 2002. There is a 8.02% increase in this time period. (See Graph 1.2)

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

1.3: Lower-Extremity Amputations, Wisconsin (2001-2014)

A total of 31,890 of lower-extremity amputations were performed from 2001 to 2014. The incidences of these amputations were highest at 2,553 in 2014 and were at their lowest at 2,062 in 2009. This represents a 0.04% increase in the number of lower-extremity amputations from 2001 to 2014. (See Graph 1.3)

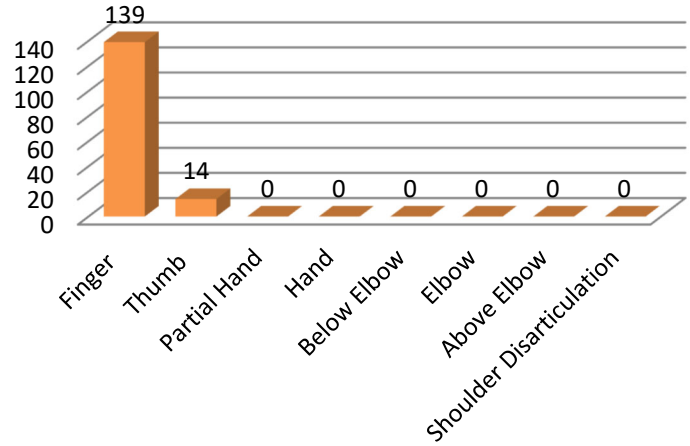


Source: Healthcare Cost and Utilization Project HCUPnet database <http://hcupnet.ahrq.gov/>

2. TYPES OF AMPUTATIONS PERFORMED

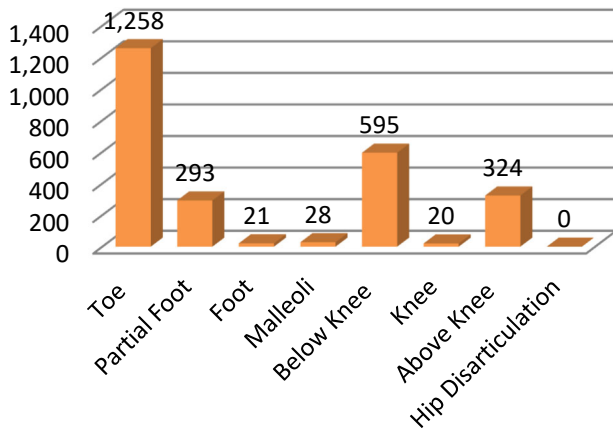
153 upper-extremity amputations were reported in 2014. The most common minor upper-extremity amputation was of the fingers (139) followed by the amputation of the thumb (14). (See Graph 2.1)

2.1: Upper-Extremity Amputations, Wisconsin (2014)



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

2.2: Lower-Extremity Amputations, Wisconsin (2014)



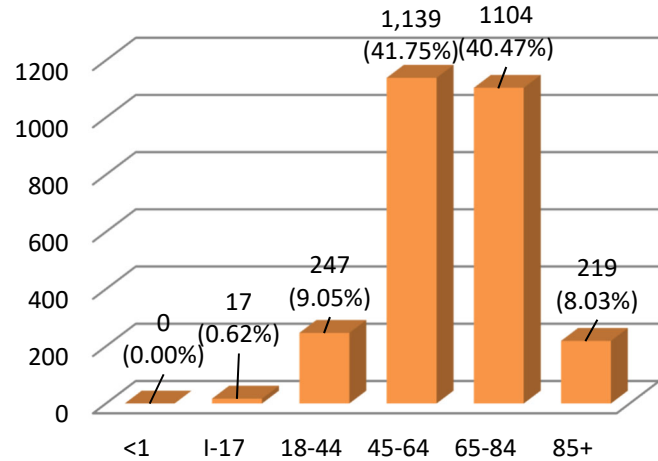
2,539 lower-extremity amputations were performed in 2014. In terms of minor lower-extremity amputations, toes (1,258) were amputated more often than part of the foot (293). For major lower-extremity amputations, below-knee (595) amputation was the most common procedure, followed by above-knee (324) procedures. (See Graph 2.2)

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

3. WHO LOSES A LIMB?

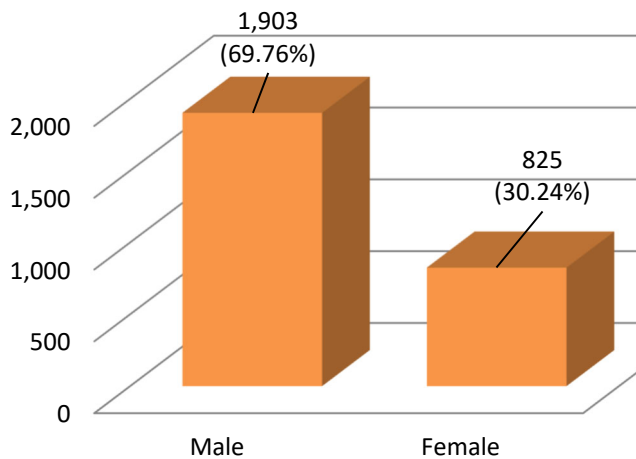
In 2014, most amputations were performed on individuals aged 45-64 years old, closely followed by the age group of 65-84 year olds (See Graph 3.1).

3.1: Amputations by Age Group, Wisconsin (2014)



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

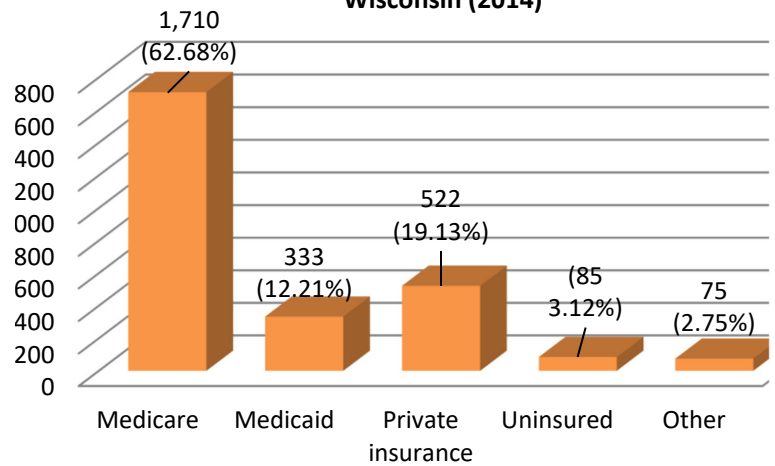
3.2: Amputations by Sex, Wisconsin (2014)



There were a little less than 2 times more amputations performed on male patients in Wisconsin than on female patients (See Graph 3.2).

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

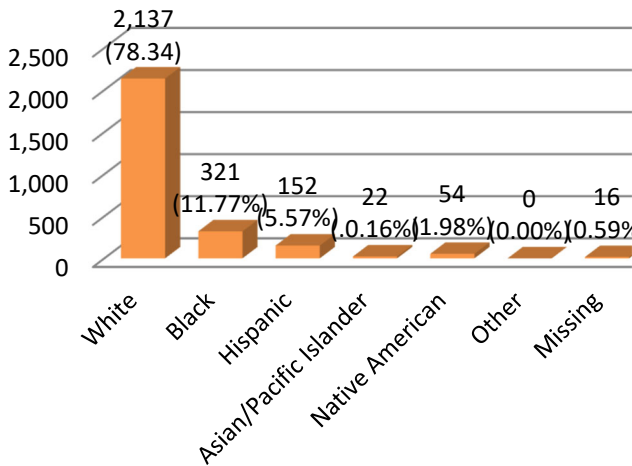
3.3: Amputations by Payer Type, Wisconsin (2014)



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

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

3.4: Amputations by Race/Ethnicity, Wisconsin (2014)



We can see that the African American population of Indiana bears the heaviest burden of amputation (0.082% of the African American population underwent amputations). This is evident when compared with the percentage of the white population that underwent amputations (0.040%), and with amputations in the state's population as a whole (0.043%). (See Graph 3.4)

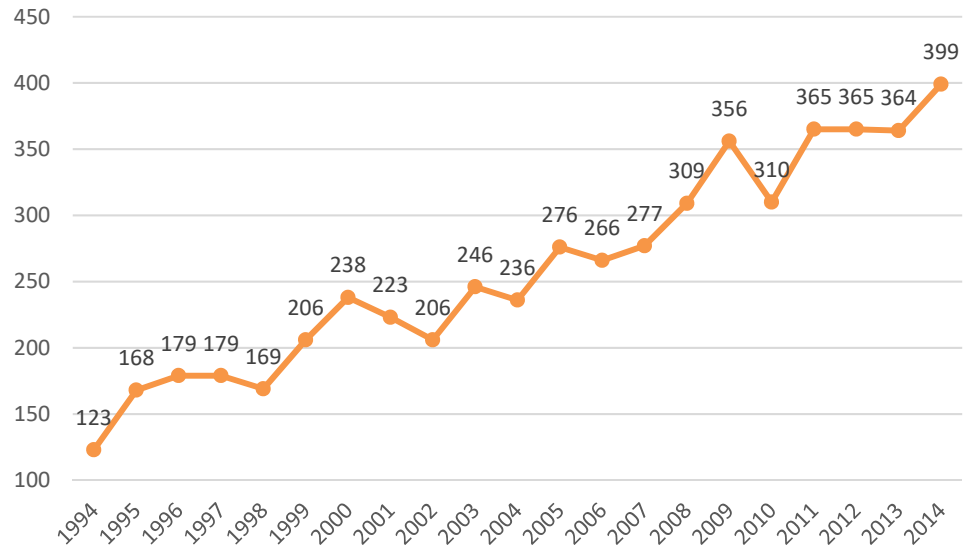
Source: Healthcare Cost and Utilization Project HCUPnet database
<http://hcupnet.ahrq.gov/>

* According to Census Bureau estimation data (<http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>), the population of Wisconsin in 2014 was about 5,724,692 and was made up of about 4,965,198 white residents and 357,758 African American residents.

4. DIABETES TRENDS

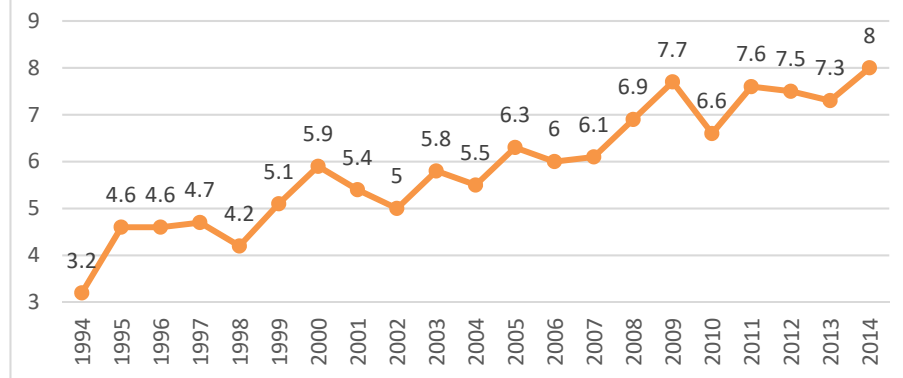
4.1: Diabetes Cases (in thousands; 18+), Wisconsin (1994-2014)

In 2014, a total of 399,684 Wisconsin residents indicated that they had been diagnosed with diabetes at some point in their lives. The prevalence of diabetes in the adult population of Wisconsin increased 195.93% from 1994 to 2014. (See Graph 4.1)



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

4.2: Existing Diabetes Cases per 100 Adults (18+), Wisconsin (1994-2014)



The annual rate of existing cases of diabetes among adults in Wisconsin increased 150.0% from 1994 to 2014. (See Graph 4.2)

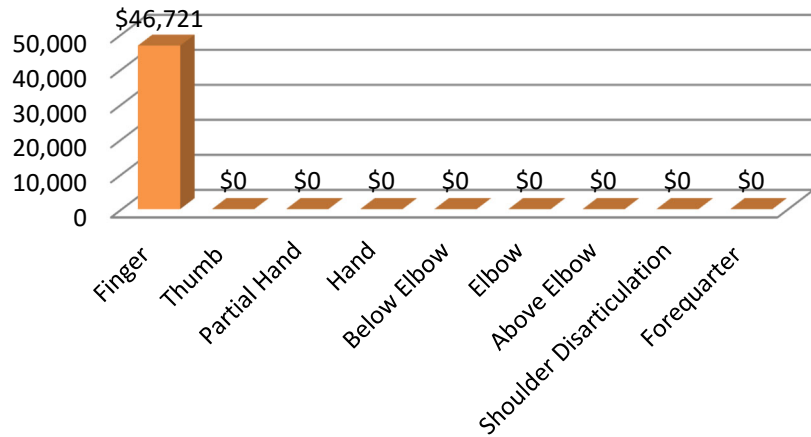
Source: CDC Behavioral Risk Factor Surveillance System <https://gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html>

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 (5). 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.

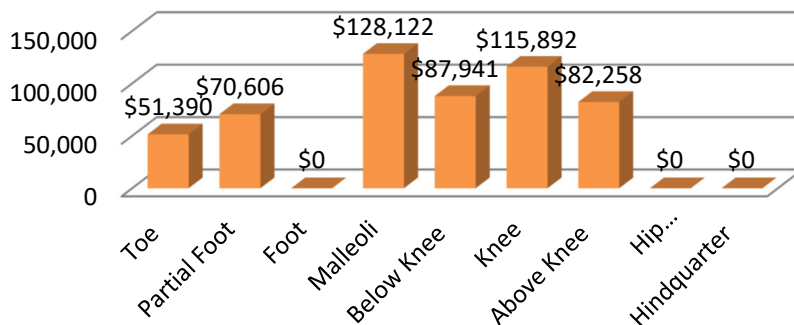
Charges represent what the hospital billed for the case, and may not represent all discharges for amputations. (See graph 5.1)

5.1: Overall Hospital Charges for Upper-Extremity Amputations, Wisconsin (2014)



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

5.2: Overall Hospital Charges for Lower-Extremity Amputations, Wisconsin (2014)



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

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

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. *Archives of Physical Medicine and Rehabilitation*2008;89(3):422-9.
2. Coalition LLTFA. Recommendations from the 2012 Limb Loss Task Force: Roadmap for Preventing Limb Loss in America. [White Paper]. 2012 February 9-12.
3. Bryant PR, Pandian G. Acquired limb deficiencies. 1. Acquired limb deficiencies in children and young adults. *Archives of Physical Medicine and Rehabilitation*2001;82(3B):00s3-s8.
4. Li Y, Burrows NR, Gregg EW, Albright A, Geiss LS. Declining Rates of Hospitalization for Nontraumatic Lower-Extremity Amputation in the Diabetic Population Aged 40 Years or Older: U.S., 1988-2008. *Diabetes Care*2012;35(2):273-7.
5. MacKenzie EJ. Health-Care Costs Associated with Amputation or Reconstruction of a Limb-Threatening Injury. *The Journal of Bone and Joint Surgery (American)*2007;89(8):1685.