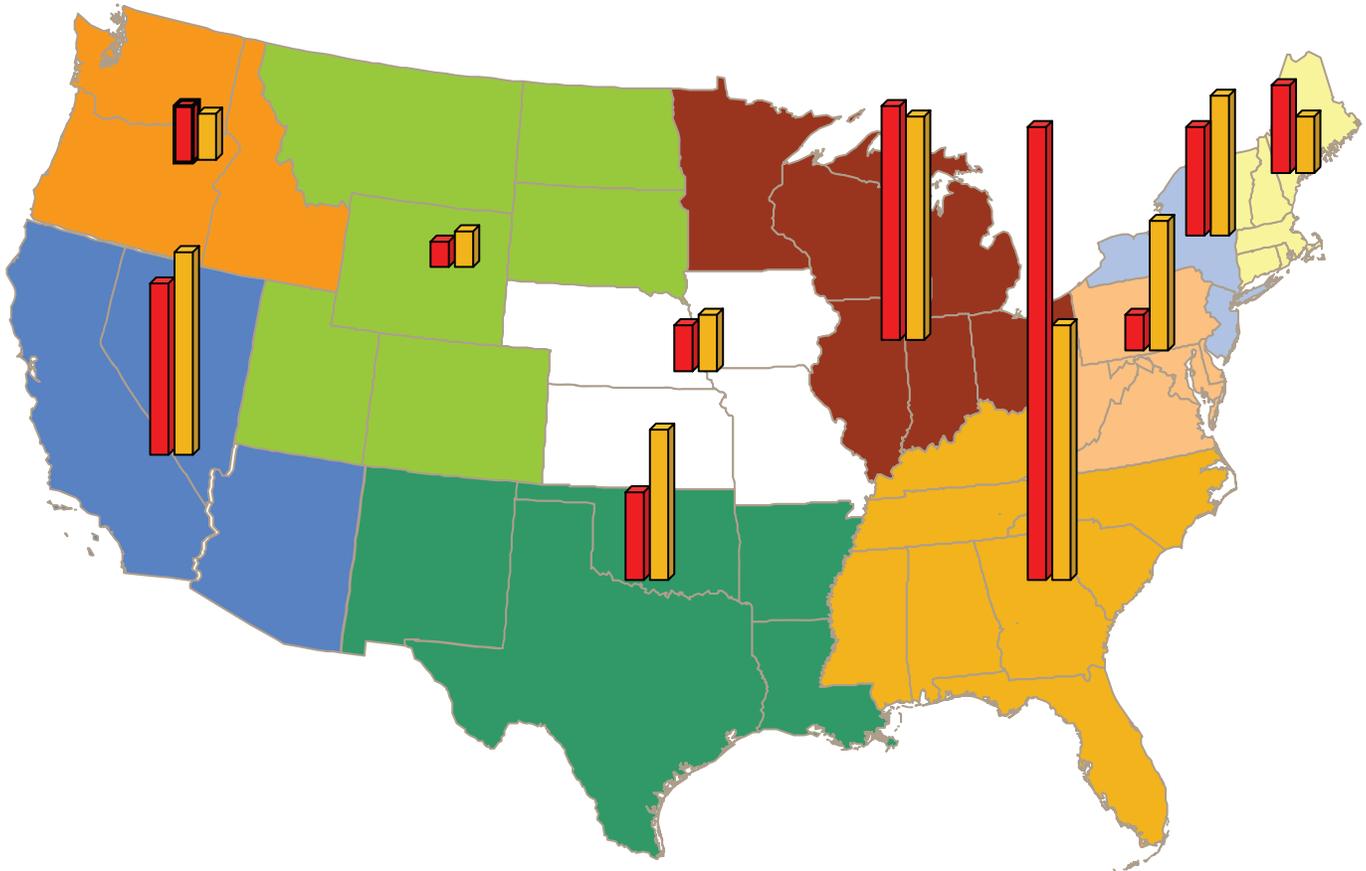


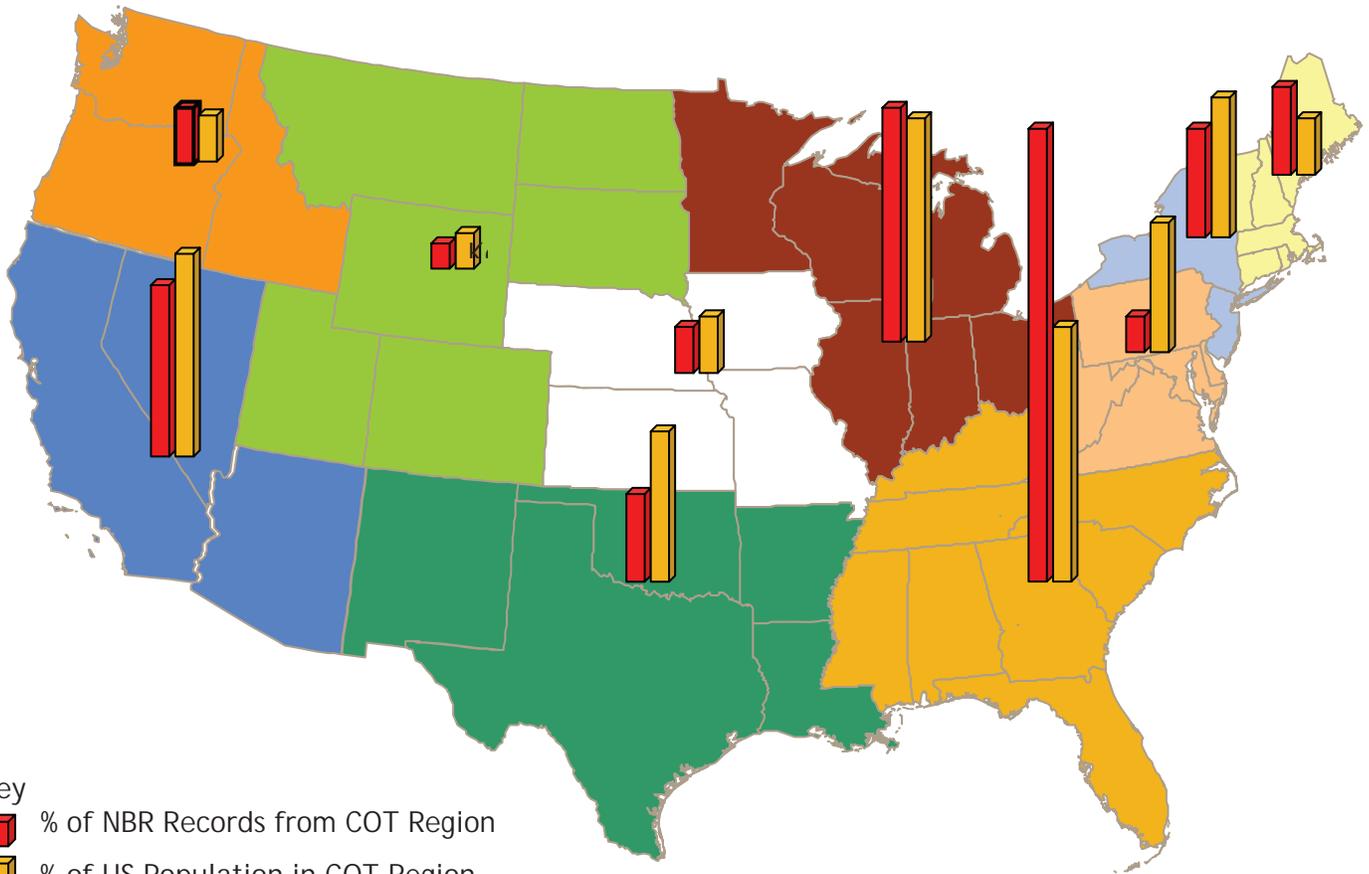
National Burn Repository

2006 Report
Dataset Version 3.0



National Burn Repository

2006 Report
Dataset Version 3.0



Key

-  % of NBR Records from COT Region
-  % of US Population in COT Region



National Burn Repository

2006 Report

American Burn Association National Burn Repository Advisory Committee

Sidney F. Miller, MD, FACS, Chair
The Ohio State University Burn Center
University Hospitals
Columbus, Ohio

David G. Greenhalgh, MD, FACS, *ex officio*
Shriners Hospital for Children
University of California Davis
Sacramento, California

James C. Jeng, MD, FACS, Co-Chair
Washington Hospital Burn Center
Washington, DC

Richard J. Kagan MD, FACS, *ex officio*
Shriners Hospital for Children
Cincinnati, Ohio

Palmer Q. Bessey, MD, FACS
New York Presbyterian Hospital
New York, New York

Barbara A. Latenser, MD, FACS
University of Iowa Hospitals and Clinics
Iowa City, Iowa

Daniel M. Caruso, MD
Arizona Burn Center
Maricopa Medical Center
Phoenix, Arizona

Christopher W. Lentz, MD
University of Rochester Medical Center
Rochester, New York

Manuel Gomez, MD, MSc
Sunnybrook Health Sciences Centre
Ross Tilley Burn Center
Toronto, Ontario

Jeffrey R. Saffle, MD, FACS
University of Utah School of Medicine
Salt Lake City, Utah

Michael J. Schurr, MD, FACS
University of Wisconsin Hospitals and Clinics
Madison, Wisconsin

American Burn Association Staff

John A. Krichbaum, JD
Executive Director

Susan M. Browning, MPH
Associate Executive Director

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Preface

Welcome to the National Burn Repository Annual Report for 2006, presenting data from January 1, 1996 through June 30, 2006. This year we have included the first comparative presentations of data over time to show what appear to be dataset trends.

Caveat Emptor (“let the buyer beware”) or in modern terms GIGO (garbage in-garbage out) applies to the NBR as much as anywhere else. The NBR Advisory Committee currently is at the “mercy” of the burn registrar, or more correctly, the supervising Burn Center director. The quality of the output (this report) is greatly dependant on the quality of the input (submitted data).

For the first time, all the records in the NBR represented in this report have been comprehensively reviewed for data completeness. Of the over 142,000 acute burn admissions, there were NO perfect records. For individual institutions, the number of missing variables ranged from 7 to 21. The average number of missing variables per record was 12 (with a range from 1 to 33). Eight variables had a missing rate of over 70%. The five top missing variables were cause of death, PI complication action, secondary payor source, co-morbidity description and percentage full thickness burn.

The Committee has wrestled with these issues, debating, for example, whether the problems emanate from software design, user training, or data collection problems. PI complication action may represent a lack of complications as could co-morbidity description. Even in records with few missing variables (five or less), the most common missing variables are disconcerting; secondary insurer (none, unknown or missing), work related (non-applicable), admission source (unknown), and state. Extensive cross review might answer these questions, but improved software, pull down menus and the expanded minimal dataset will go a long way to clarifying these issues and bringing precision to the dataset.

Version 5.0 of the NTRACS burnware software, scheduled for release in Fall 2007, will add to this precision with a Windows based program containing extensive pull down menus. Not only will the pull-down menus help in data precision, the format by which data is prepared for transmission to the NBR will be changed, with a pre-transmittal data validation that will allow the registrars and the Burn Center director to correct the record and help to ensure that the data submitted is as complete as possible. As a Committee, however, we can only ‘dress up’ what is submitted. A registry such as ours should, by definition, raise more questions than it answers—we leave to individual researchers the expanded investigation and mining of the data.

Extensive analysis of the current dataset used in this report has been undertaken by the Committee. The new, colorful graphic on the cover shows the percent of NBR records by region, compared to the percent of US population by region. The regions shown are based upon the American College of Surgeons Committee on Trauma organization. Alaska and Hawaii are not included on the US cover map because these states have yet to contribute to the NBR. In addition, new tables have been added to the 2006 report, yearly comparison data has been reviewed, and periodic “Glimmers from the NBR,” have been published in the *Journal of Burn Care & Research*. For next year, we hope to add a subset of the data to the ABA website. We believe the publication of this report will stimulate quality improvement programs in burn care, as burn center compare their performance with the national data and as NBR research is expanded.

I extend my thanks to all of the hospitals that contributed to the NBR and to the members of the NBR Advisory Committee for their work in the analysis and preparation of this report. The Committee again wants to thank the ABA staff for the enormous amount of effort and support they have given in this year’s report analysis and preparation, particularly Susan M. Browning, MPH and John A. Krichbaum, JD.

Sidney F. Miller, MD, FACS—Chair, ABA NBR Advisory Committee

Introduction and Overview

“Annually, on time, and in color...” Since the creation of the ABA NBR Advisory Committee in 2005, this has been our mantra. With the delivery of this third major report, the goal seems to be attainable.

Effective July 1, 2005, the American College of Surgeons and the American Burn Association contracted out the responsibility for software support and development of the National Burn Repository (NBR) to Digital Innovation, Inc. At the end of 2005, the ABA Board of Trustees created two new committees to spur evolution of the software and the National Burn Repository to the next logical plateau:

- The TRACS Users Committee, which focuses on improving the data collection/entry process by working closely with software users and Digital Innovation, Inc.
- The NBR Advisory Committee, which focuses on promoting and facilitating the scholarly and policy advocacy initiatives related to the National Burn Repository data.

Significant progress has been made during 2006-2007, with many firsts and new deliverables as a result. A uniform data dictionary, developed by the TRACS Users Committee, is nearly ready for general distribution. The latest software revisions widely employ drop-down menus from which to populate data entry fields and have built-in checks on the internal-consistency of data entry. Both of these improvements are critical to our renewed focus on the quality of data records submitted to the NBR.

Likewise, the NBR Advisory Committee showed solid gains with their agenda. The first of six 2007 “Glimmers” from the NBR was published along with an editorial and primer (Appendix C) describing how to go about accessing NBR data for research use in the January – February 2007 issue of the *Journal of Burn Care & Research*. These Glimmers are quick abstracts of NBR data meant to pique the interest of the readership towards conducting their own research and publications.

The first instance of an ABA committee commissioning information from the NBR for a defined agenda also came to pass this year. Dr. Michael Peck, chair of the Government Affairs Committee, is leading an effort to look at migration of patients across state lines in search of tertiary burn care. Although still early in its development (and fully open to all burn centers to participate), the geographic information teased out of the NBR is compelling and will nicely assist this committee’s legislative agenda.

Finally, several other approaches to wider use of the NBR remain for this academic year’s efforts. Partnerships with universities (e.g. schools of public health, departments of applied math/statistics, etc.), other ABA committees, and government institutions will be pursued. Please refer to Appendix B as an overview of the global plans for the continued diffusion of the repository data.

Both committees sincerely hope that this current report will incite an even broader participation of the ABA membership with the National Burn Repository in the coming year. We continue to nurse the development and improvement of OUR national database with this in mind. Sharpen your pencils and get to work!

James C. Jeng, MD, FACS—Co-Chair, ABA NBR Advisory Committee

National Burn Repository

Summary of the Findings

1996 - 2006

This report of the National Burn Repository reviews the combined data set of *acute burn admissions* for the period 1996 – 2006. Key findings include the following:

1. Seventy hospitals from 30 states plus the District of Columbia contributed to this report, totaling 142,318 records. Fifty-nine hospitals contributed more than 500 cases. Data are not dominated by any single center and appear to represent a reasonable cross section of US burn center hospitals.
2. Nearly 70% of the burn patients were men. Mean age for all cases was 30 years old. Infants under 2 years of age accounted for 9% of the cases while patients age 60 or older represented 14% of the cases.
3. Sixty-three percent of the reported total burn sizes were less than 10% TBSA. Sixty-eight percent of the full thickness burns (third degree) were under 10%. Inhalation injury was present in 6% of the total reported cases, but played an important role in increasing hospital length of stay and risk of death.
4. The two most common reported etiologies were flame burns and scalds, accounting for almost 8 out of 10 cases. Hot liquids and vapors or boiling tap water were the first and fifth most commonly reported e-codes and accounted for 21% of all injuries with an identified mechanism. There were 7,427 scald injuries in the under 2 years old age group, making up 25% of all scald injuries and 64% of all reported injuries to the under 2 population.
5. Forty-two percent of the burn injuries were reported to have occurred in the home.
6. Where transfer information was reported, 56% of patients were transferred or referred from another acute care facility prior to arrival at the reporting hospital.
7. Ninety-five percent of patients survived hospitalization. The cause of death for those who died was recorded in only 46% of the cases. The leading cause of death was multiple organ failure, accounting for 27% of cases with a specified cause. Treatment was withheld in 14 % of cases.
8. Deaths from burn injury increased with advancing age and burn size, and presence of inhalation injury.
9. Hospital length of stay increased significantly with total burn size and presence of inhalation injury.
10. During the ten year period 1996 – 2006, average length of stay declined from 13 days for women and 12 days for men to approximately 6 days for each. The case fatality rate for women in 1996 was over 8%, but it had decreased to 4% in 2006. For men, the case fatality rate has remained at approximately 6% during the entire period.

Patient Sample

All cases received from contributing hospitals (TRACS software and non-TRACS software users) that met the data structure requirements were initially accepted into the NBR. This report includes only cases from U.S. burn centers with an admit year of 1996 – 2006, inclusive. Records were excluded from the analysis for this report if the “Admit Type” was readmission; admission for reconstruction/rehabilitation; outpatient encounter; same patient; scheduled/elective admission; or acute admission, not burn injury related. Records were also excluded from the analysis of this report if they contained missing values for gender or if hospital LOS < ICU days.

The National Burn Repository 2002 report included 54,038 acute burn admissions from 1974 through 2002. After the 2005 Call for Data, a decision was made to report yearly on the previous decade’s worth of data in the NBR. The 2005 report summarized 126,642 acute burn admissions within US burn centers from 1995 through 2005. The 2006 report includes 119,250 patients from the 2005 report and an additional 23,068 cases submitted in 2006 for a total of 142,318 acute burn admissions within US burn centers from 1996 through 2006.

Data submission has increased substantially since 2002, thus 2002 through 2005 are somewhat over weighted in the report, and 1996 through 2001 are somewhat under weighted. The timeliness of submission has also increased as 20,274/23,068 (88%) of the additional cases submitted for this report were admitted in 2005 or 2006. However, the 2006 data (with 10,507 cases through June 30, 2006) is only partially collected, and there is some additional delay in reporting to the National Burn Repository.

Efforts have been made to analyze completeness of reporting in the NBR. A comparison of the number of NBR records compared to the population of each the ten regions assigned by the American College of Surgeons Committee on Trauma reveals reasonable correlation in 7 of the 10 regions, as noted on the front cover of this report.

Patient Characteristics

Demographic analysis reveals that 70% of all patients were men. The mortality rate by gender is shown over time in this report and there seems to be a gender discrepancy on mortality in the earlier years; however, this discrepancy disappears by 2002. Length of stay analyzed by gender shows a steady decrease in mean total hospital days for men and women. Designations for race and ethnicity showed that 58% of the patients were reported as “Caucasian,” 17.4% reported as “African-American,” and 12.8% were Hispanic. Only minor variations exist from the 2002 or 2005 report.

Infants under 2 years of age accounted for 9% of the total cases and patients 70 years of age or older accounted for 8.4% of the cases. About 31% of admissions were in those less than 20 years old, and approximately 63% of patients were between the ages of 5 and 50. The less than 2 age group unfortunately remains a high risk population for sustaining a burn injury. The percent of patients that lived or died by age category is further shown emphasizing that mortality and age are closely related.

Burn size and the presence of inhalation injury remain significant predictors of mortality. Burn size has been analyzed with regard to total body surface area (TBSA) burned, and TBSA sustaining full-thickness or partial-thickness burn. The majority (63%) of patients had total burn size less than 10% TBSA, 21% had burn size between 10% and 19.9% TBSA, and 7% had burn size between 20% and 29.9% TBSA. Only 9 % of patients had burn size of 30% or greater TBSA.. The number of cases of full thickness or partial thickness burns also show predominance for burns less than 10% TBSA. The impact of burn size and inhalation injury has been further analyzed by patient age in this report. In addition, data is presented throughout the report on the impact of burn size on outcomes in those over and under 65 years of age.

Injury Event

Flame burns and scalds account for over 78% of the total cases in this report (Figure 12). Skin diseases represent about 1.4% of reported cases. The top twenty list of External Cause of Injury Codes (E Codes) is shown in Figure 13. The E924 series of codes for scald injuries (hot liquids related to cooking/eating or hot tap water (bath/shower/sink)) accounted for almost 40 % of the top 10 E-codes and nearly 20% of all burn mechanisms. Figures 12B and 12C depict injury etiology or mechanism by age group. The table lists the number of records for each age group and mechanism, and below that is the percentage of all cases in that age group and the percentage of cases of that particular mechanism. For example, there were 1,147 flame burns in children 2-4.9 years of age. Those 1,147 cases made up 18% of all burn mechanisms in the 2-4.9 age group and 4% of all flame injuries.

Most injuries (43%) occurred in the home as indicated by the E849 place of occurrence category (Figures 14 and 15). Eight percent of cases were reported as having occurred in an industrial / at work setting.

The circumstances of injury are depicted in Figures 16 and 17. Approximately 90% of the injuries were accidental. Work related injuries comprised 17% of all cases. Suspected intentional injuries (self-inflicted or assault) accounted for 5% of the cases.

Approximately two-thirds of records contained information about transfer or referral from another acute care facility prior to arrival at the reporting hospital. Of those who reported, 56% were transferred or referred from another facility (Figure 18).

Outcome

134,754 patients (94.7%) survived hospitalization. 7,564 patients succumbed to their injury (5.3%). The outcome of care (lived or died) is shown in Figure 19.

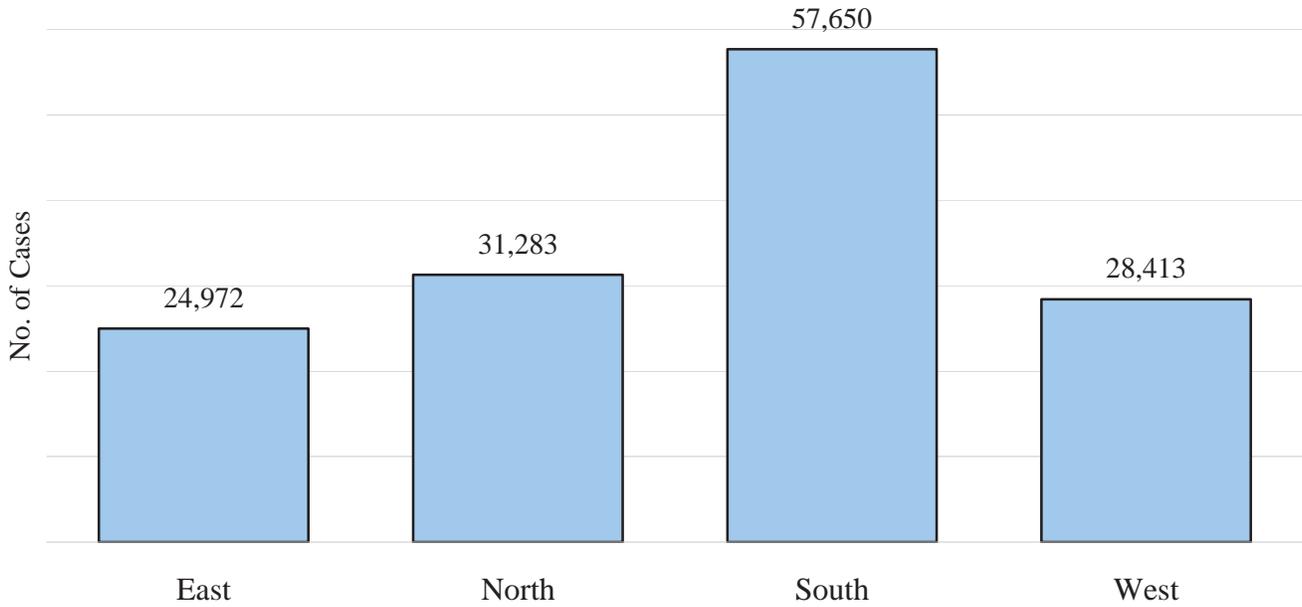
The cause of death was reported for 3,463 (46%) of patients that died during hospitalization. Figure 20 shows that the leading cause of death in the burn patients remained multiple organ failure. About 14% of the recorded causes of death were attributed to “treatment withheld”, a fairly sizeable increase from the 10% reported with the 2002 data call. The outcome of care (lived or died) for the risk factors of age, burn size (Table 11), and presence of inhalation injury (Tables 8 and 10) are reported in separate analyses as well.

It is important to note that 50,177 (63% of those with recorded burn size) patients had burn wounds involving less than 10% TBSA and comprised 63% of the total cases. Deaths from burn injury increased with age and burn size. Of the 7,920 patients designated as having suffered inhalation injury, 2,041 died, a mortality rate of 25.8% (vs. 28.8% in 2002 report). In contrast, only 5,426 of the 124,645 patients without inhalation injury died (4.4% [vs. 2.9% in 2002 report]).

National Burn Repository

Figures

Figure 2. Contributing U.S. Hospitals by Geographical Region



North – Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **South** – Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Tennessee, and Texas. **East** – District of Columbia, Maryland, Massachusetts, New Jersey, and New York. **West** – Arizona, California, Colorado, Nevada, Oregon, Utah, and Washington.

Figure 3. Arrival/Admission Year, Acute Burn Admissions

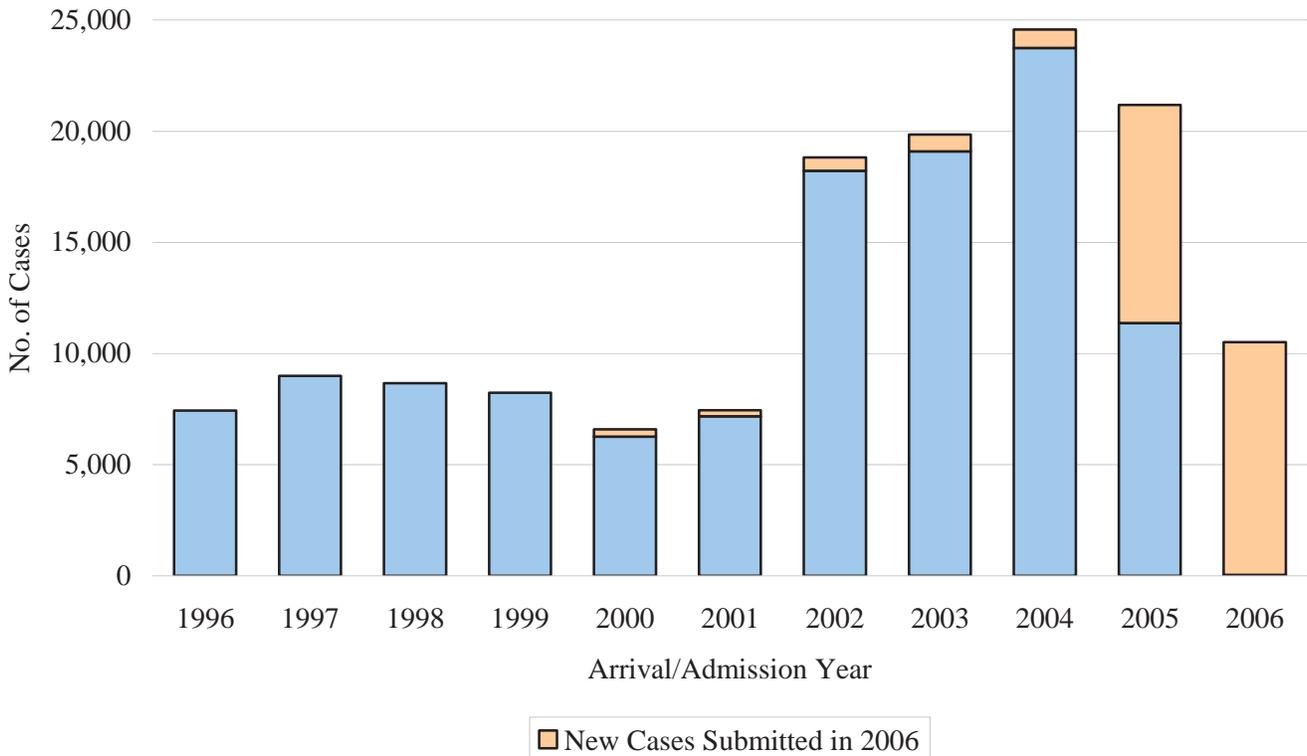
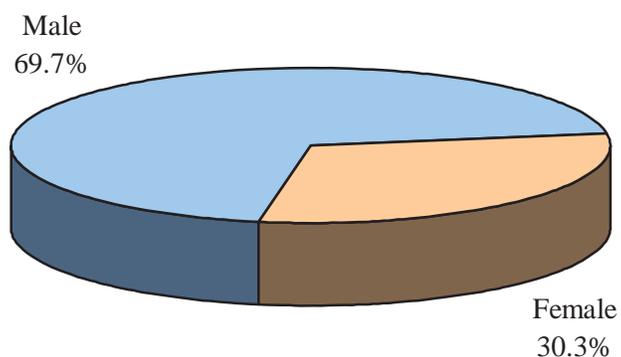
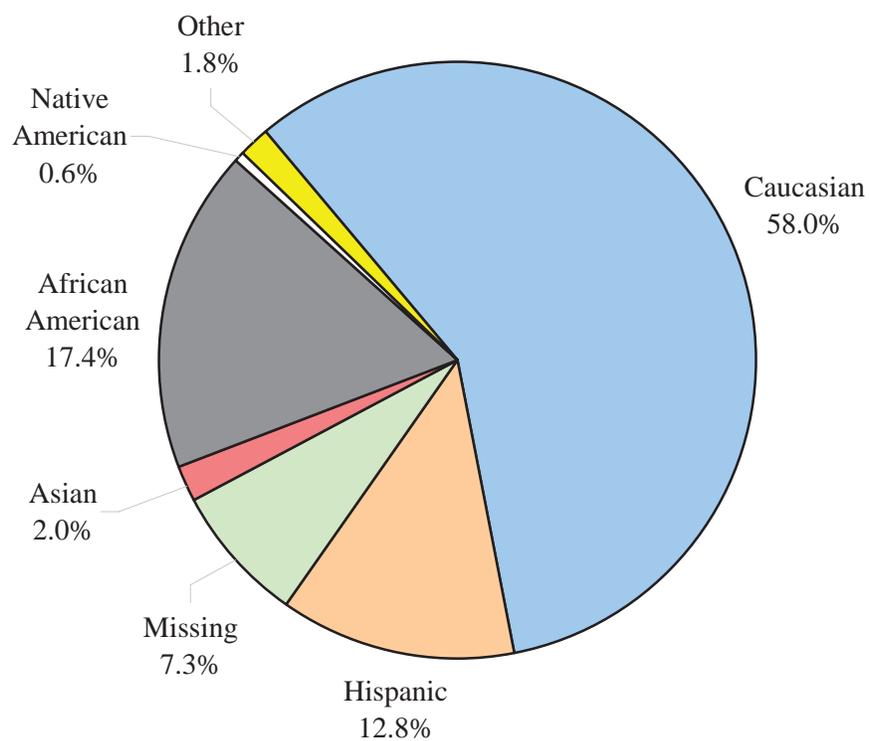


Figure 4. Gender*



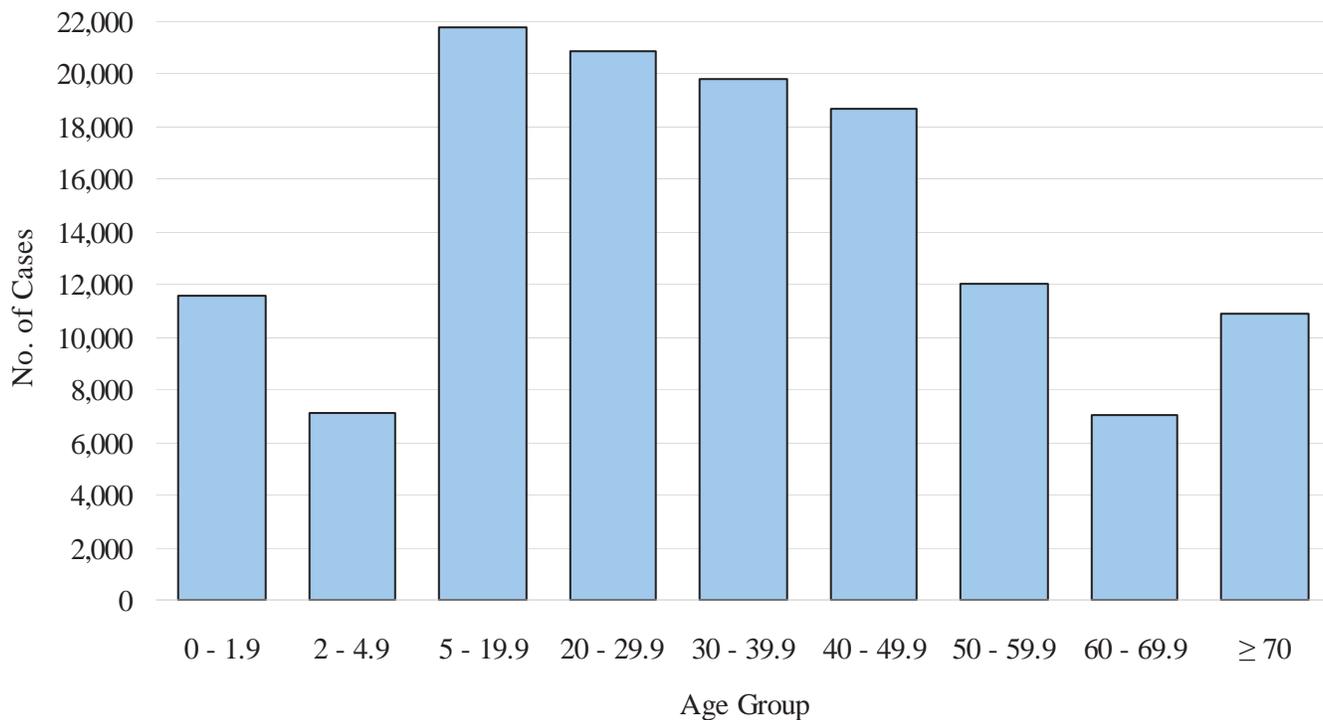
*Total N=142,318

Figure 5. Race/Ethnicity*



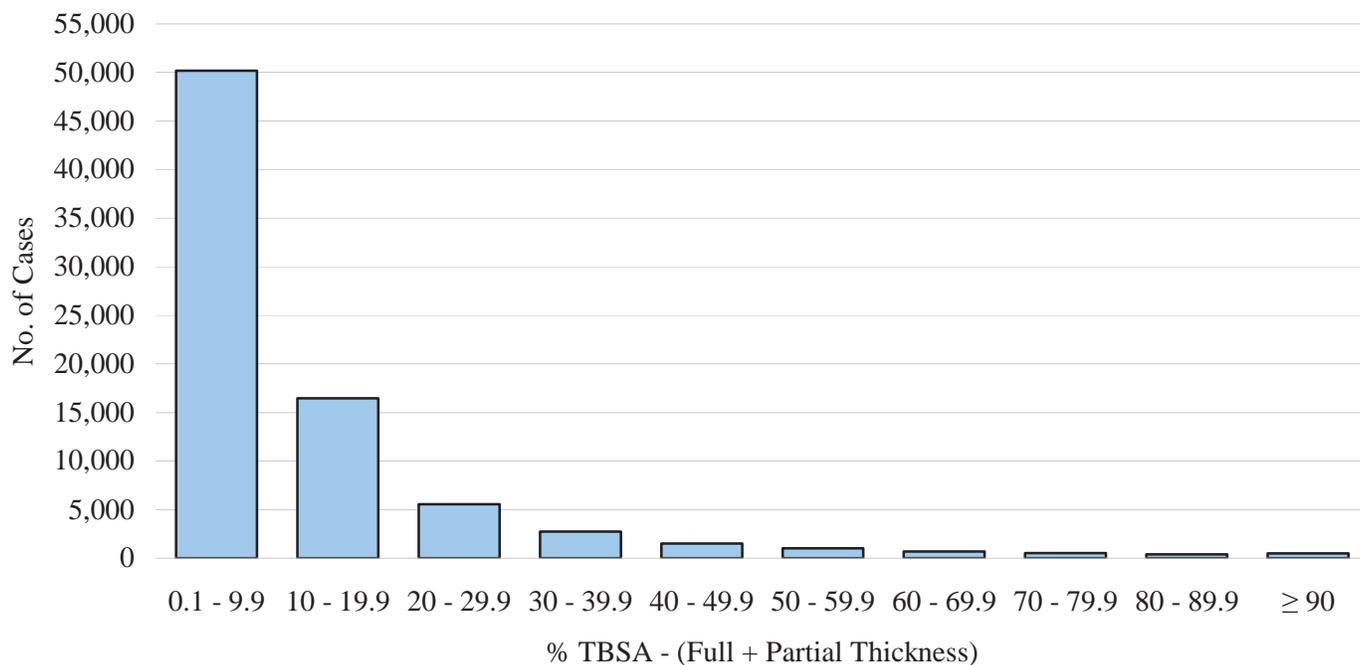
*Total N=142,318

Figure 6. Age Group*



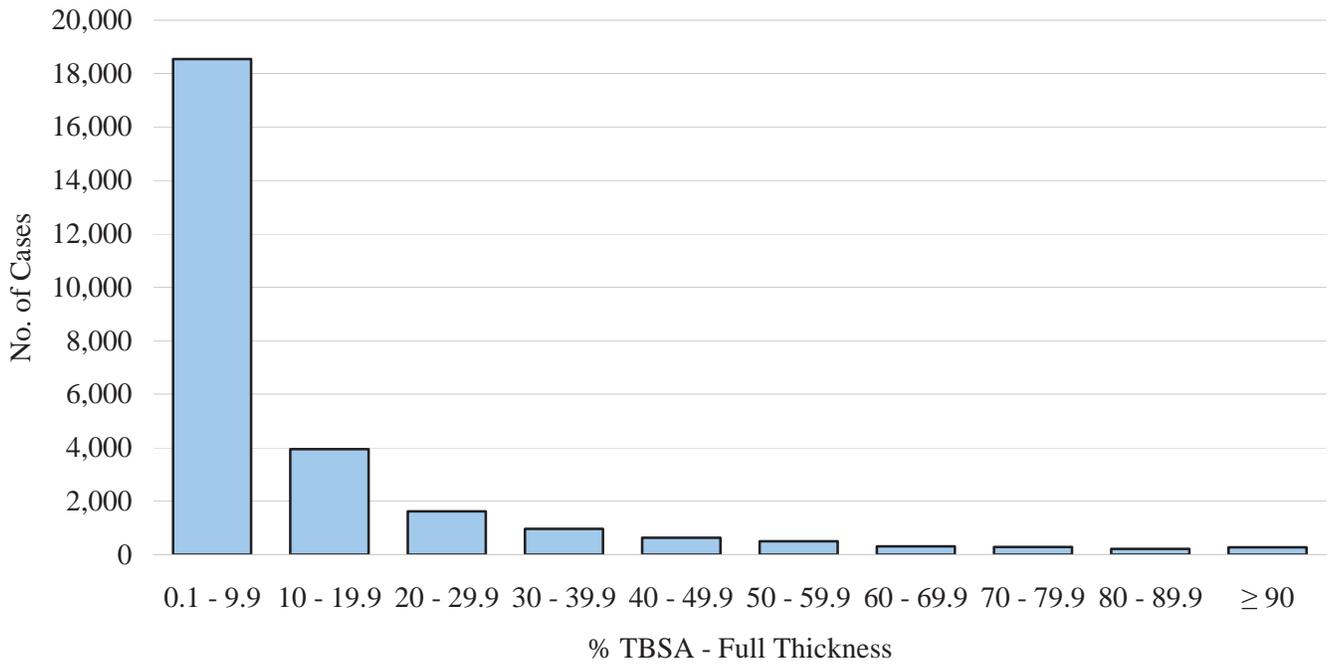
*Total N=129,694 (Excludes Unknown/Missing)

Figure 7. Burn Size Group (% TBSA)*



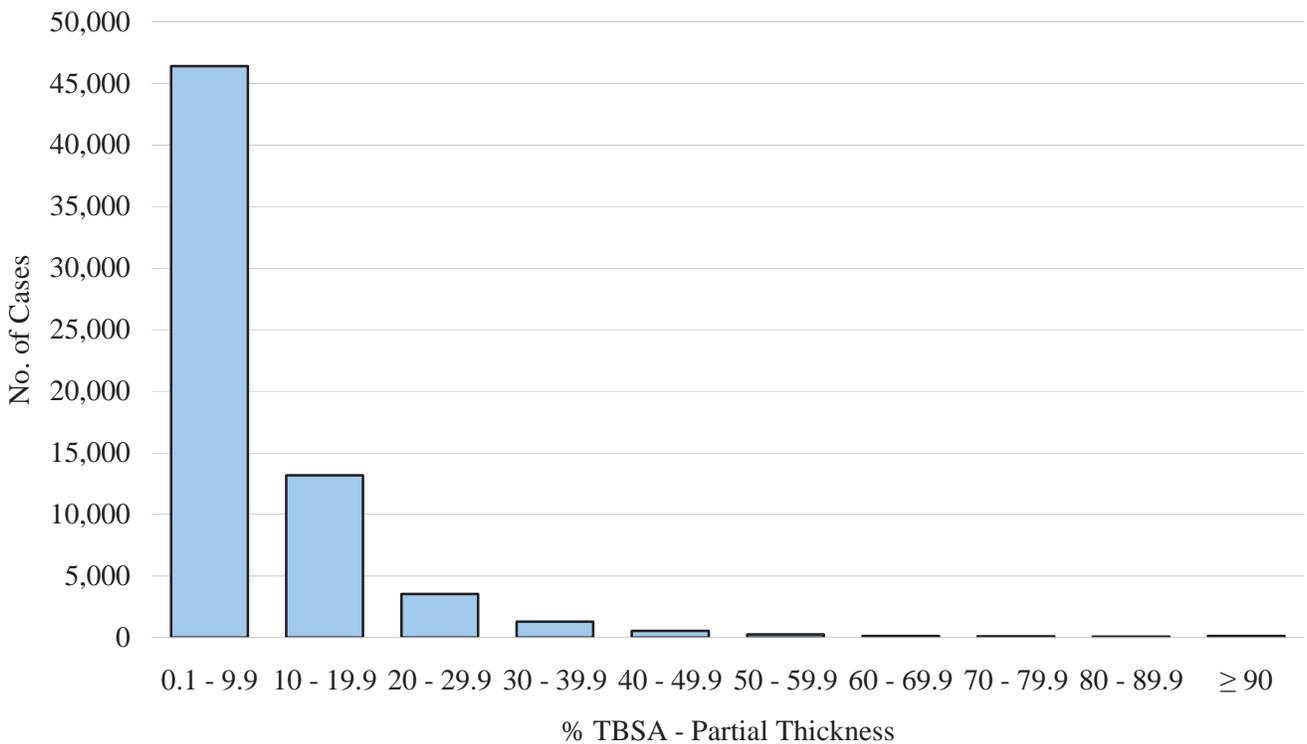
*Total N=79,571 (Excludes Unknown/Missing)

Figure 8. Burn Size Group (% TBSA) – Full Thickness Burns*



*Total N=27,266 (Excludes Unknown/Missing)

Figure 9. Burn Size Group (% TBSA) – Partial Thickness Burns*



*Total N=65,637 (Excludes Unknown/Missing)

Figure 10. Burn Size Group (% TBSA) – Total, Full Thickness, Partial Thickness

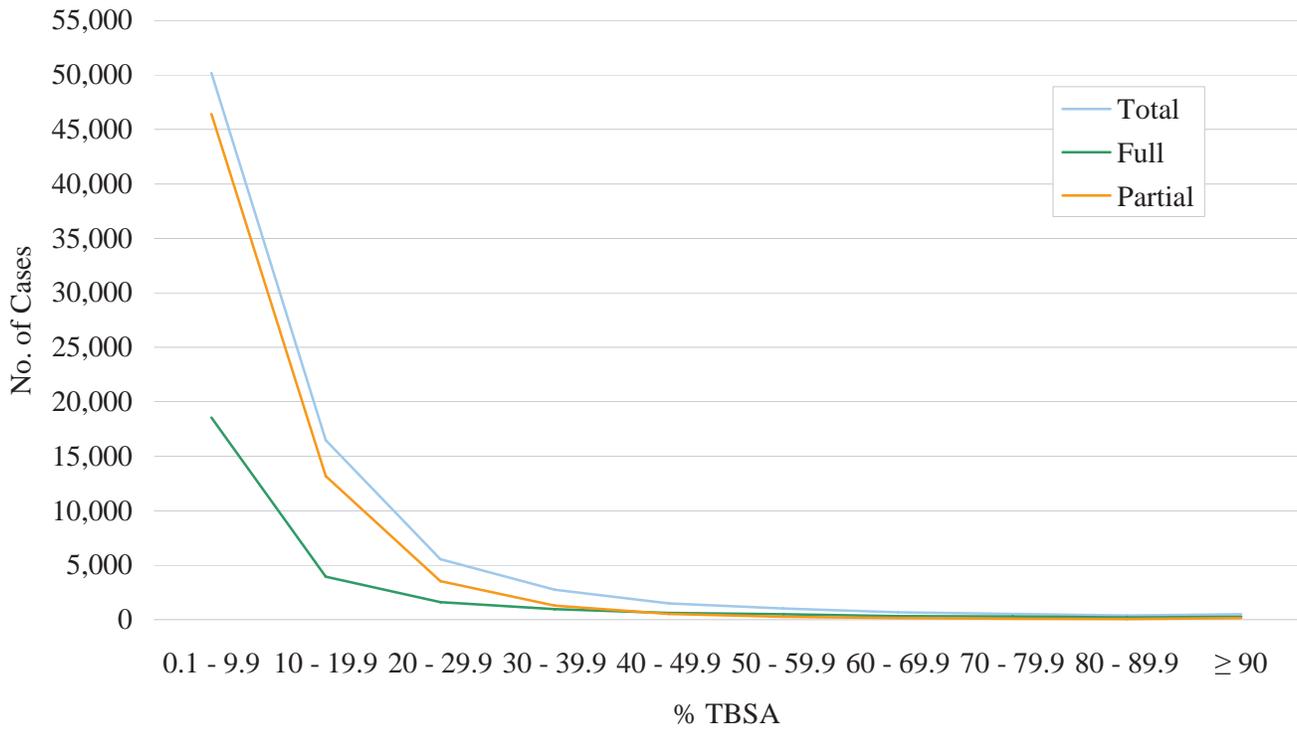
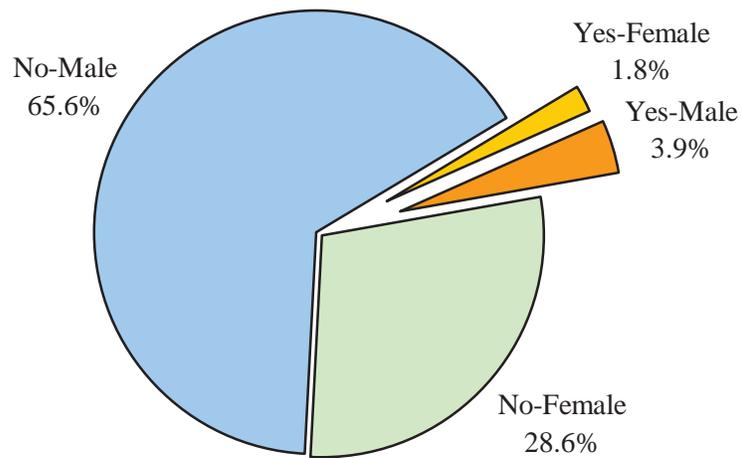
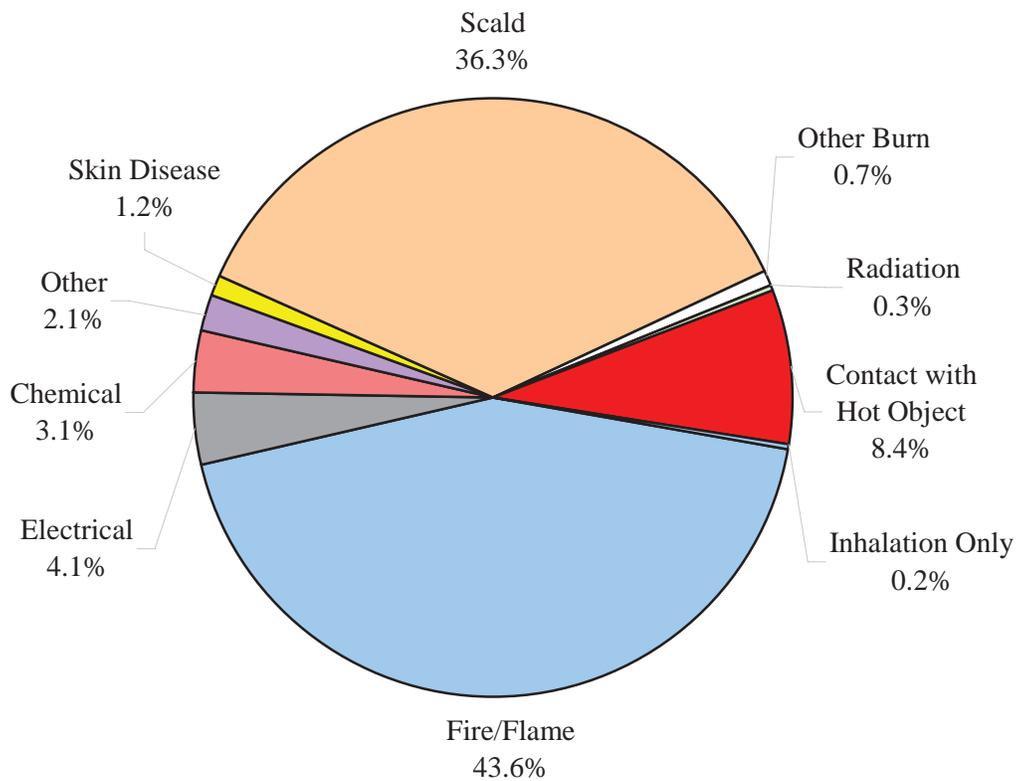


Figure 11. Inhalation Injury by Gender*



*Total N=137,991 (Excludes Unknown/Missing)

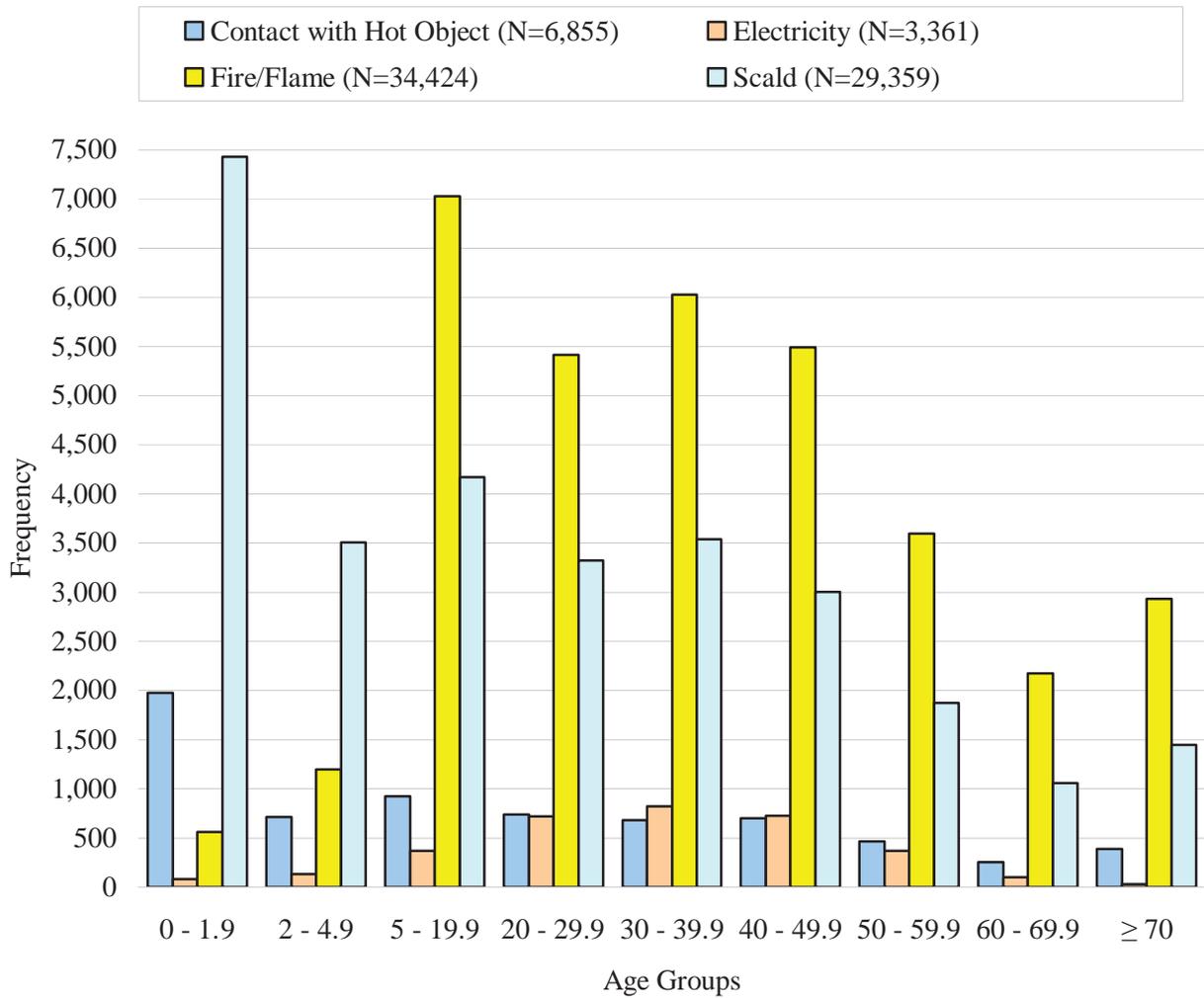
Figure 12. Etiology*



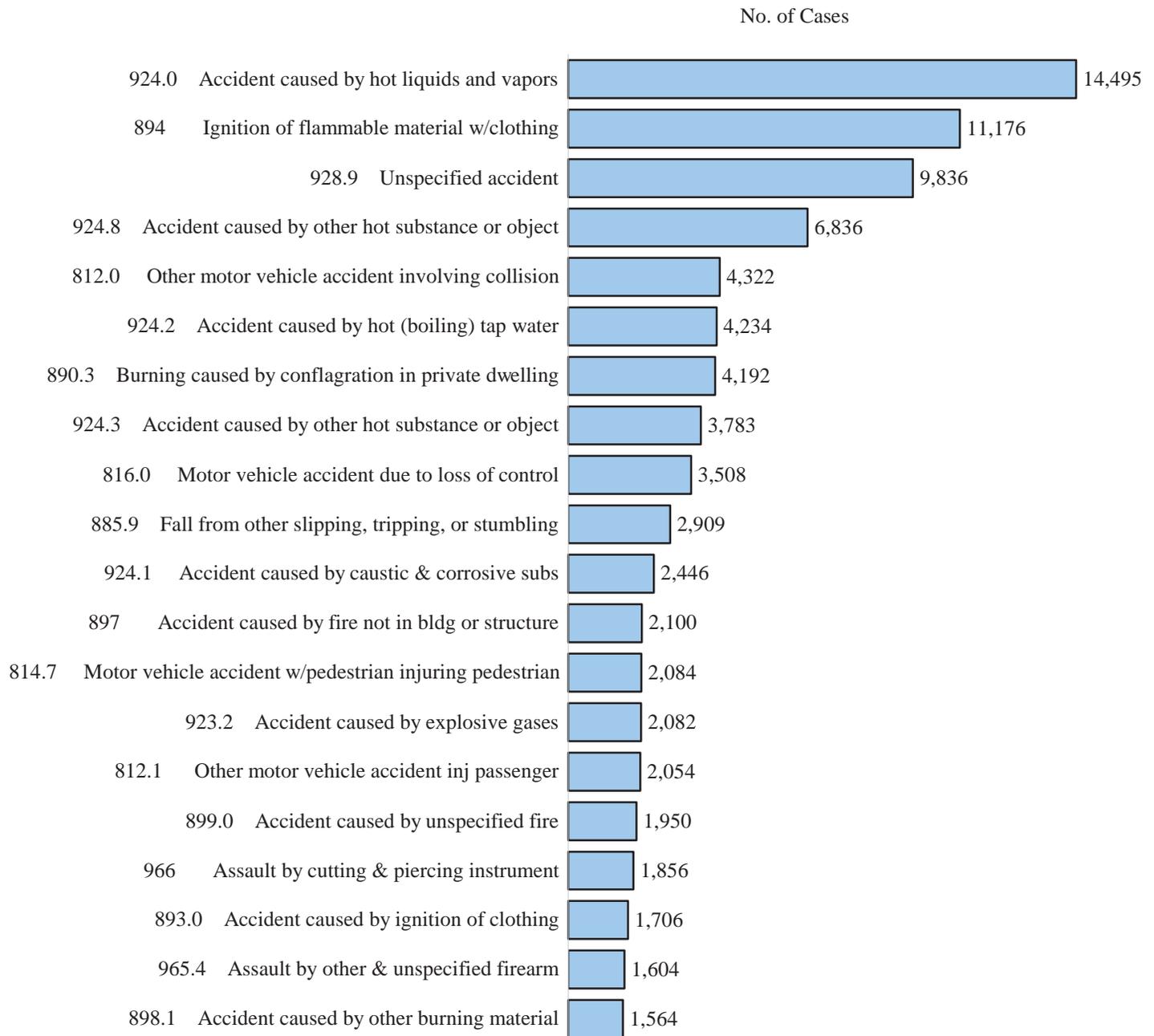
*Total N=86,820 (Cases Where Etiology Was Included)

Figure comparing the frequency of contact with hot objects, electricity, flame, and fire by age group.

Figure 12B. Frequency of Contact with Hot Object, Electricity, Fire, or Flame by Age Group*



*Total N=73,999

Figure 13. Top Twenty E-Codes*

* Total N=84,731 (Excludes Unknown/Missing)

Figure 14. Place of Occurrence – E849 Code

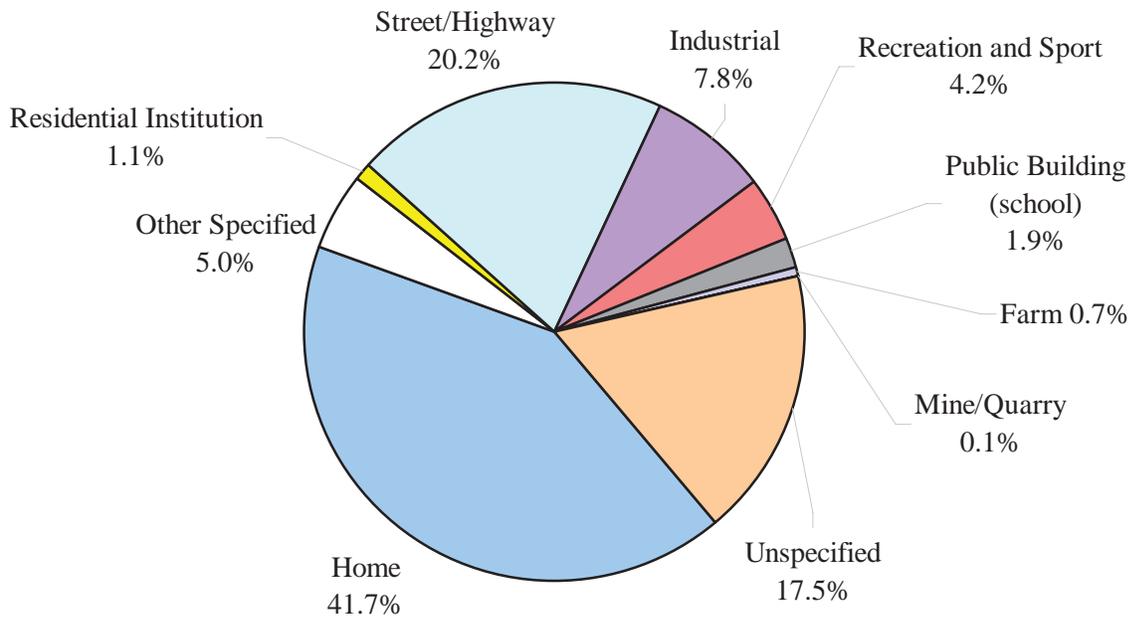


Figure 15. Place of Occurrence – E849 Code

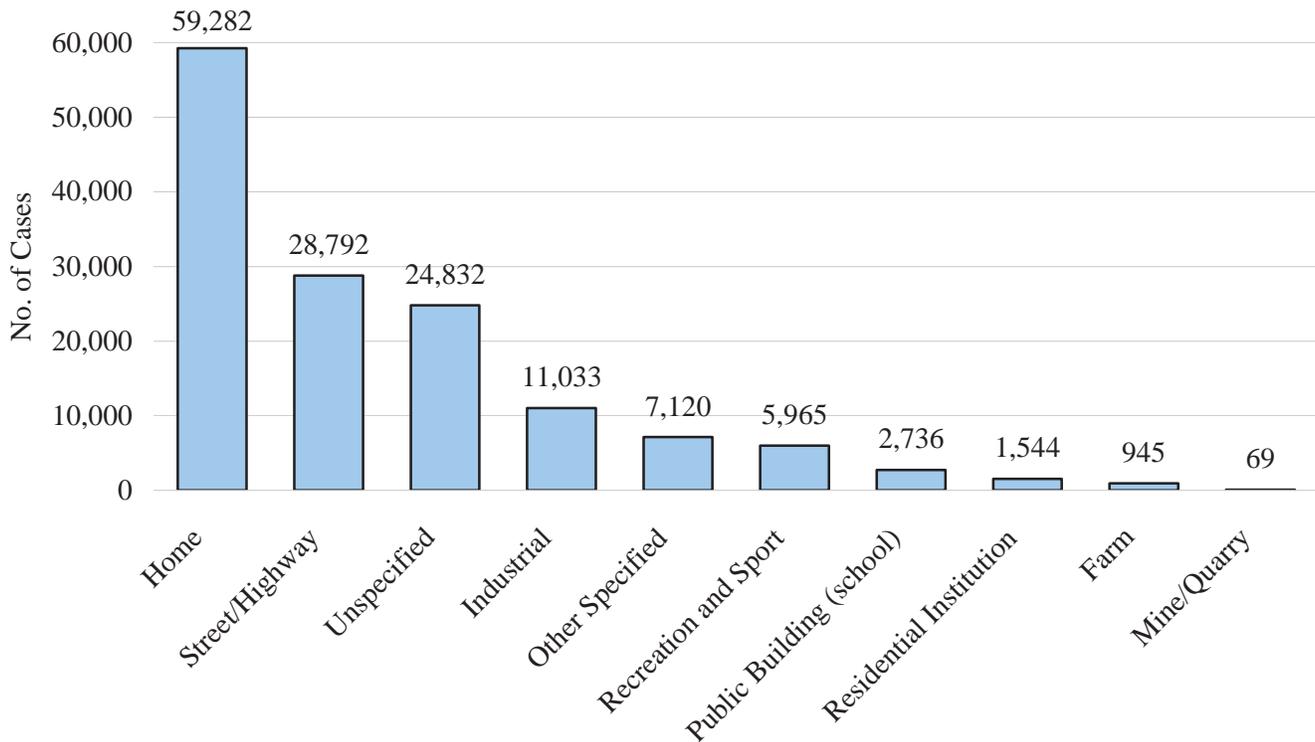
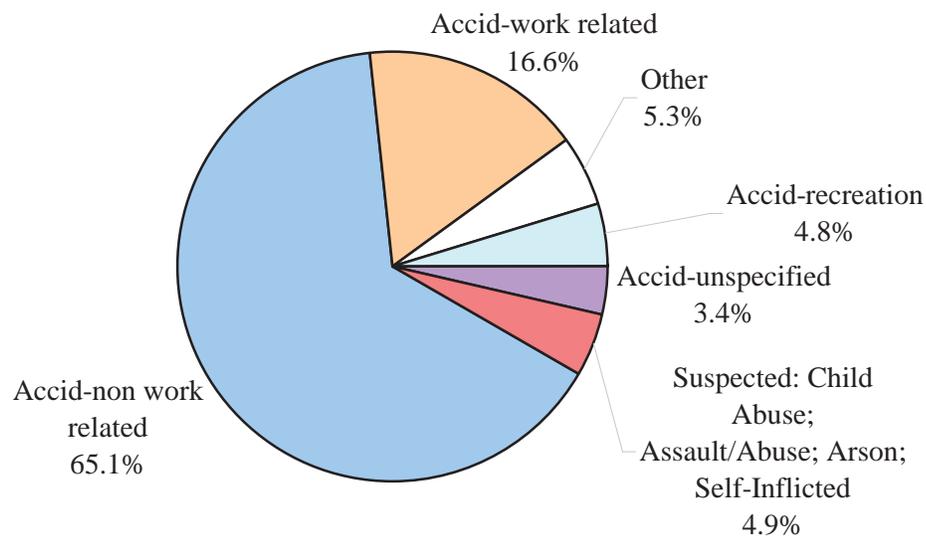
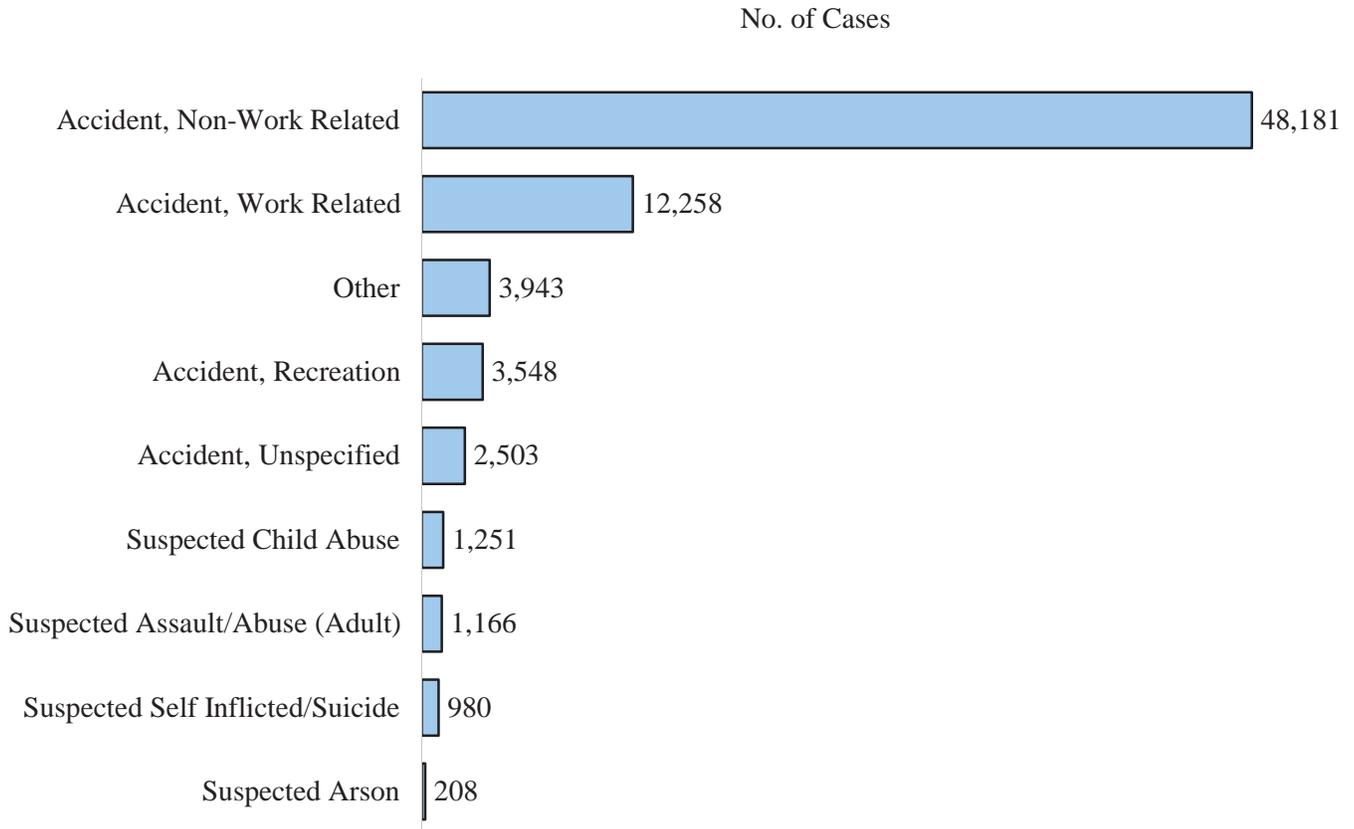


Figure 16. Circumstances of Injury*



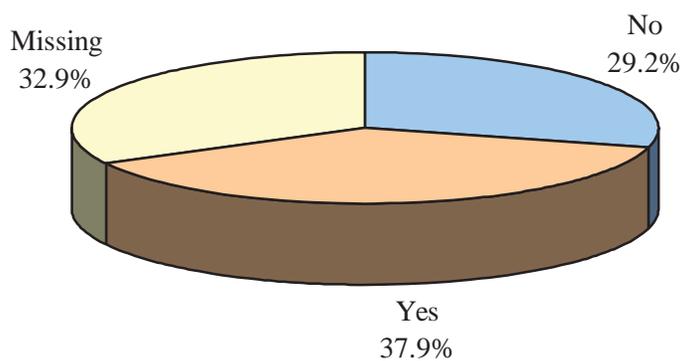
*Total N=74,038 (Excludes Unknown/Missing)

Figure 17. Circumstances of Injury*



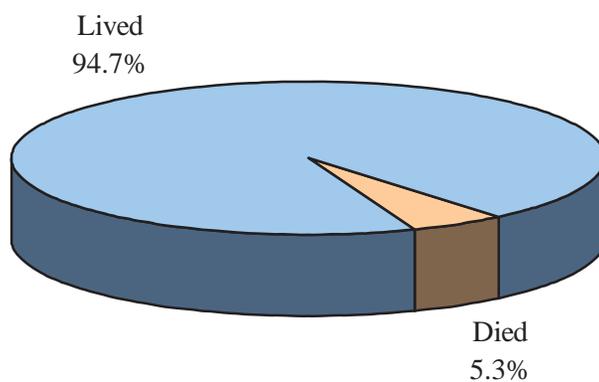
*Total N=74,038 (Excludes Unknown/Missing)

Figure 18. Hospital Transfer*



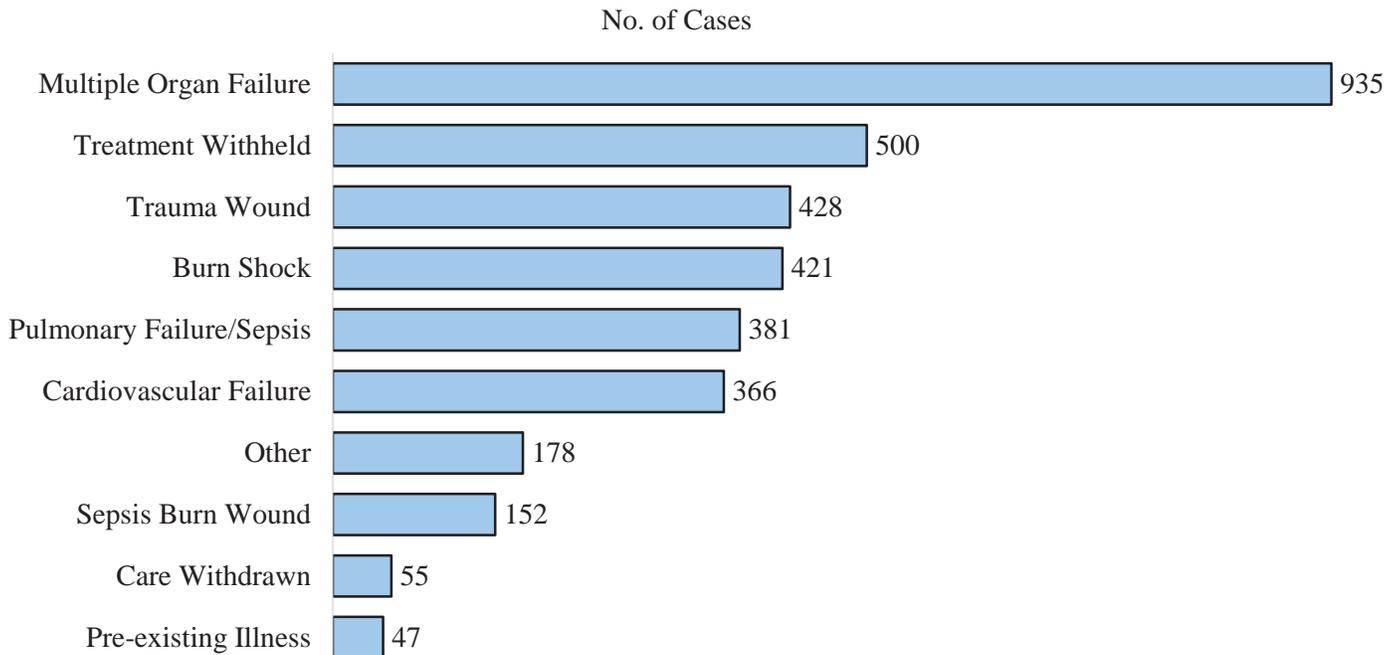
*Total N=142,318

Figure 19. Hospital Disposition



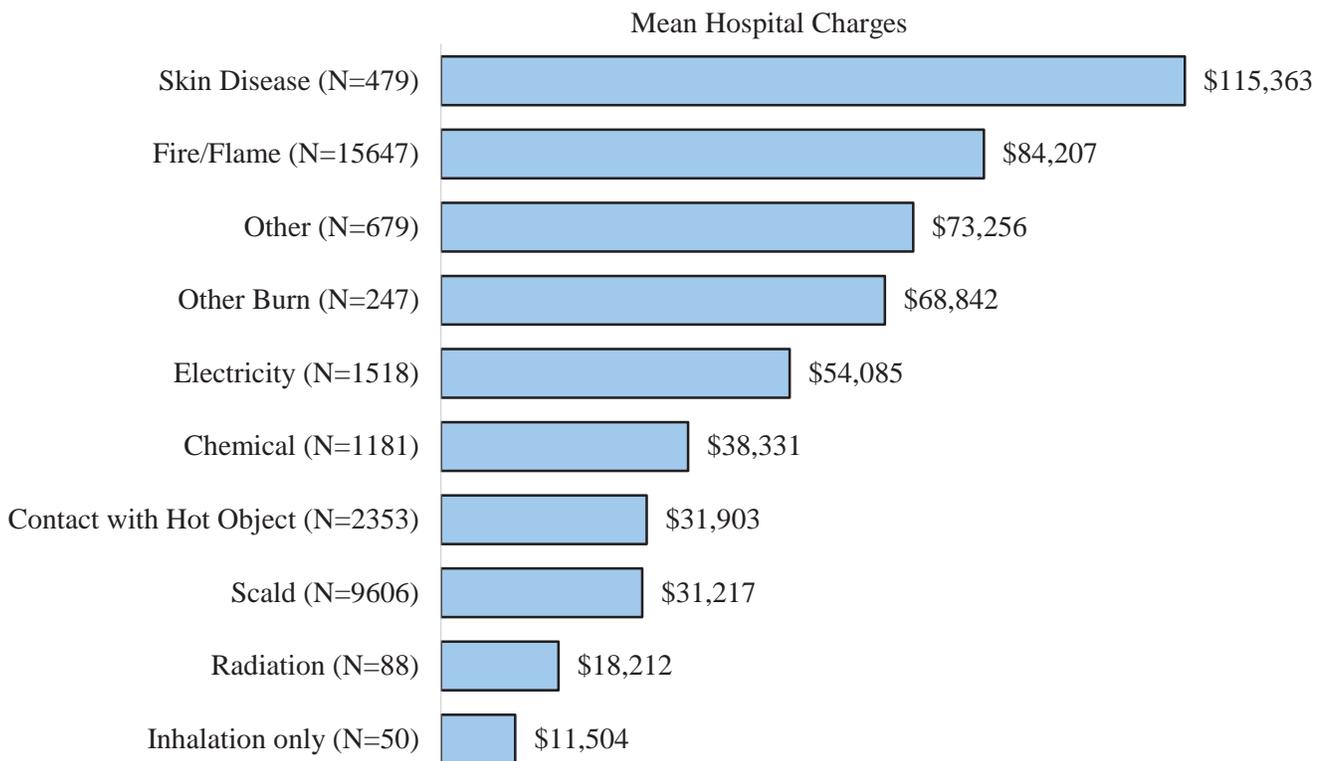
*Total N=142,318

Figure 20. Cause of Death*



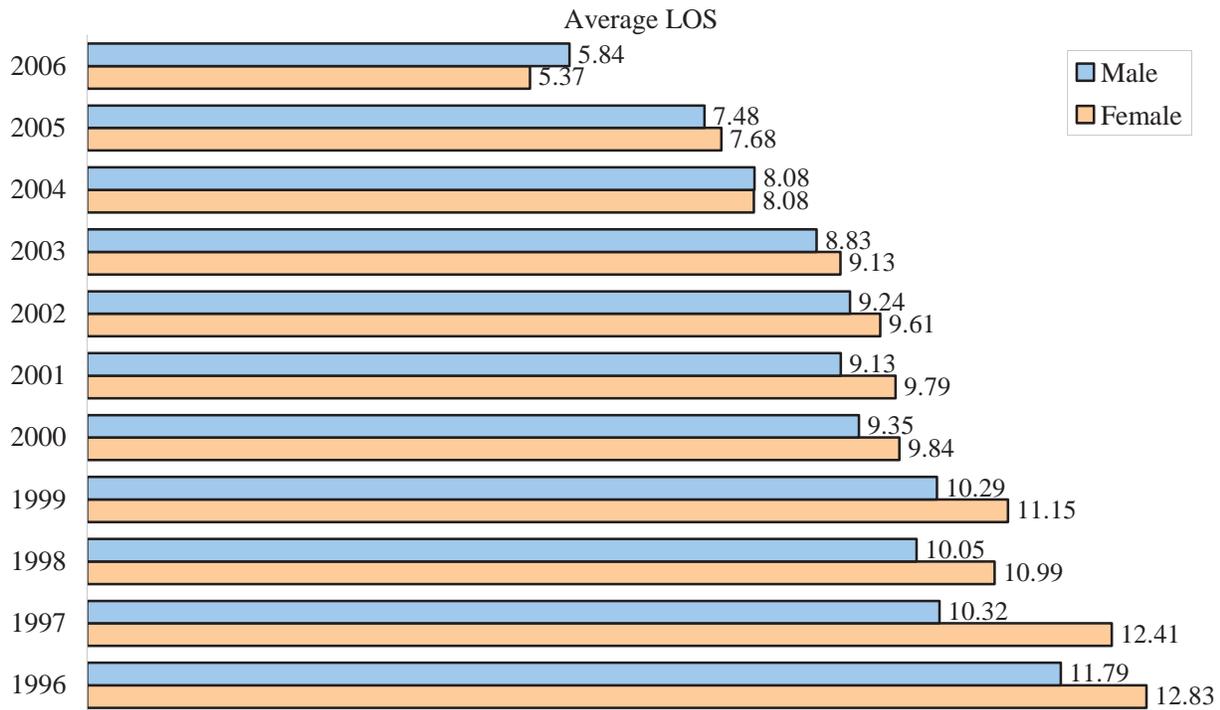
* In 3,463 deaths where the cause of death was specified

Figure 21. Hospital Charges by Etiology*



* In 31,848 cases where both etiology and charges were specified

Figure 22. Average Hospital LOS by Gender, 1996 - 2006*



*Total N=142,318

Figure 23. Mortality Rates by Gender, 1996 - 2006

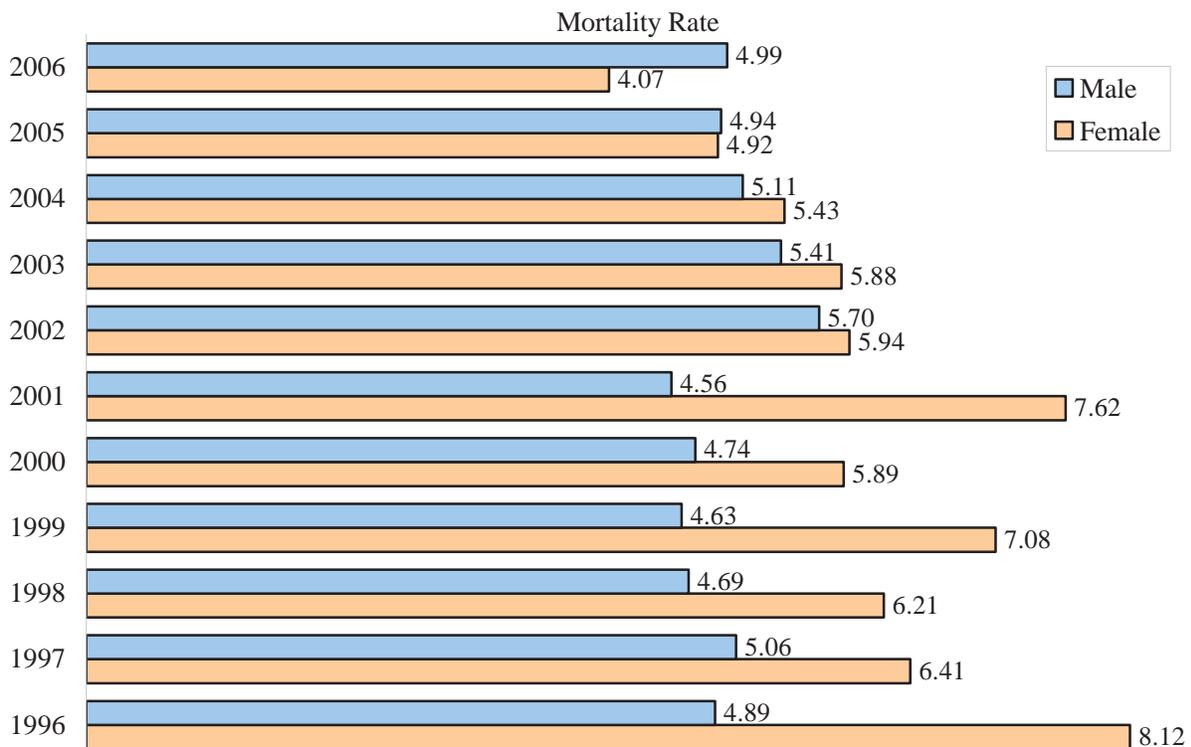
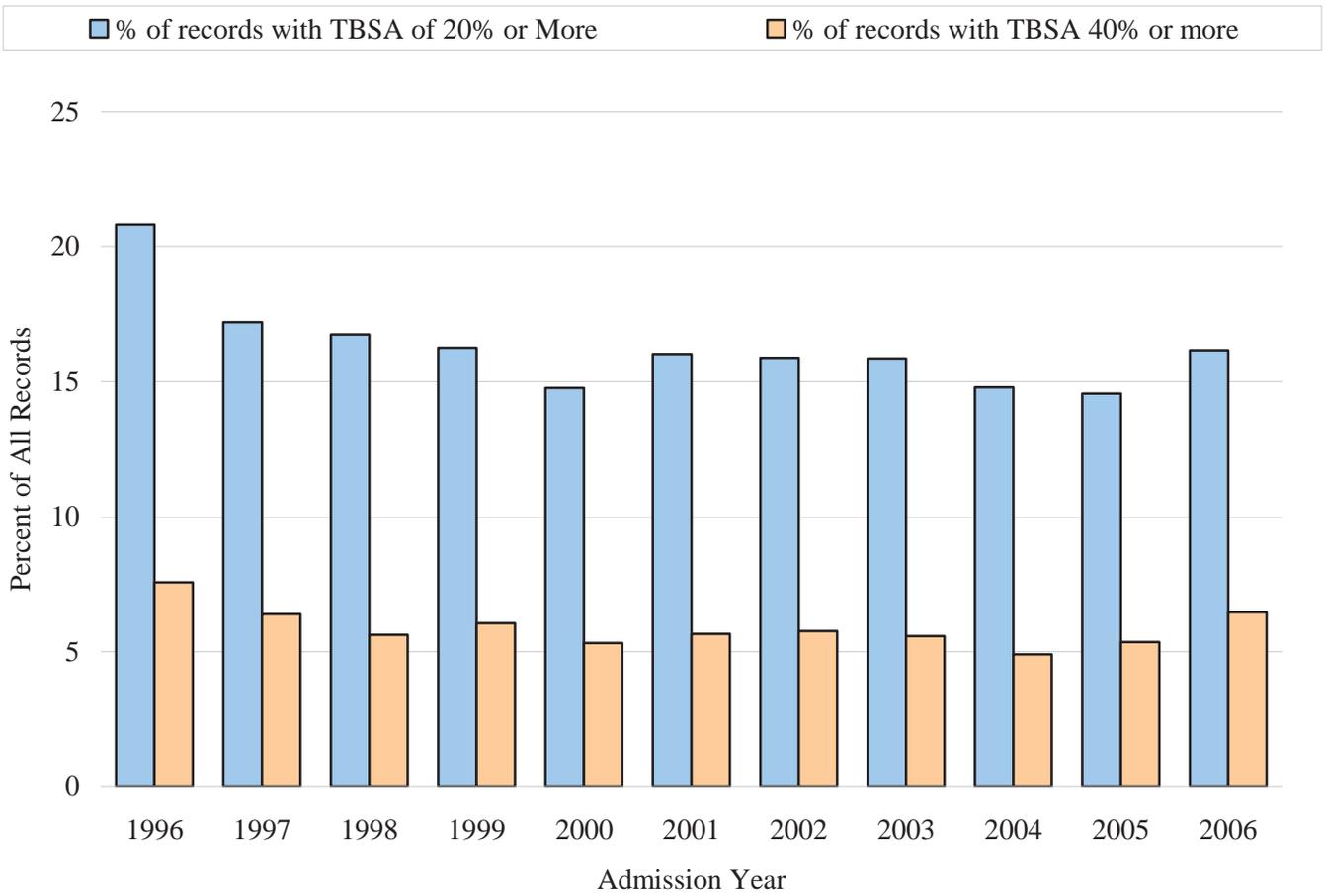


Figure 24. Percent of Records in the 20% and Above TBSA Category and 40% and Above TBSA Category, by Year*



*Total N=79,572

National Burn Repository

Tables

Table 1. Arrival/Admission Year, Acute Burn Admissions

Year	Previously Submitted	No. of Cases Submitted in 2006	Total No. of Cases
1996	7,442		7,442
1997	8,997		8,997
1998	8,669		8,669
1999	8,231	10	8,241
2000	6,261	328	6,589
2001	7,173	282	7,455
2002	18,221	601	18,822
2003	19,099	747	19,846
2004	23,743	826	24,569
2005	11,373	9,808	21,181
2006	41	10,466	10,507
TOTAL			142,318

Table 2. Age Group

Age Group	No. of Cases	Valid Pct.
0 - 1.9	11,542	8.9
2 - 4.9	7,073	5.5
5 - 19.9	21,805	16.8
20 - 29.9	20,849	16.1
30 - 39.9	19,774	15.2
40 - 49.9	18,671	14.4
50 - 59.9	12,055	9.3
60 - 69.9	7,013	5.4
≥ 70	10,912	8.4
Subtotal	129,694	100.0
Missing	12,624	
TOTAL	142,318	

Table 3. Etiology

Etiology	No. of Cases	Valid Pct.
Fire/Flame	37,826	43.2
Scald	31,508	36.0
Contact with Hot Object	7,330	8.4
Electrical	3,530	4.0
Chemical	2,704	3.1
Other Nonburn	1,808	2.1
Skin Disease	1,033	1.2
Unknown	810	0.9
Other Burn	635	0.7
Radiation	252	0.3
Inhalation Only	194	0.2
TOTAL	87,630	100.0

Table 4. Top Twenty E-Codes

E-Code and Description	No. of Cases	Pct.	Valid Pct.
924.0 Accident caused by hot liquids and vapors	14,495	6.5	22.2
894 Ignition of highly flammable material with ignition of clothing	11,176	5.0	17.1
928.9 Unspecified accident	9,836	4.4	15.1
924.8 Accident caused by other hot substance or object	6,836	3.1	10.5
812.0 Other motor vehicle traffic accident involving collision with motor vehicle injuring driver of motor vehicle other than motorcycle	4,322	2.0	6.6
924.2 Accident caused by hot (boiling) tap water	4,234	1.9	6.5
890.3 Burning caused by conflagration in private dwelling	4,192	1.9	6.4
924.3 Accident caused by other hot substance or object	3,783	1.7	5.8
816.0 Motor vehicle traffic accident due to loss of control, without collision on the highway, injuring driver of motor vehicle other than motorcycle	3,508	1.5	5.4
885.9 Fall from other slipping, tripping, or stumbling	2,909	1.3	4.5
898.1 Accident caused by other burning material	1,564	1.1	2.9
965.4 Assault by other & unspecified firearm	1,604	1.0	2.5
893.0 Accident caused by ignition of clothing from controlled fire in private dwelling	1,706	0.9	2.5
966 Assault by cutting & piercing instrument	1,856	0.9	2.5
899.0 Accident caused by unspecified fire	1,950	0.9	2.4
812.1 Other motor vehicle traffic accident involv collision w/motor vehicle inj passenger in moto vehicle other than motorcycle	2,054	0.9	2.3
923.2 Accident caused by explosive gases	2,082	0.8	2.2
814.7 Motor vehicle traffic accident involv collision w/pedestrian injuring pedestrian	2,084	0.8	2.0
897 Accident caused by controlled fire not in building or structure	2,100	0.7	1.9
924.1 Accident caused by caustic & corrosive subs	2,446	0.7	1.9
Top Twenty Total	84,737	38.11	

Table 5. Cause of Injury by Age Group*

Age Group	Etiology											Total
	Chemical	Contact	Electrical	Fire	Inhal Only	Other Burn	Other Nonburn	Radiation	Scald	Skin Disease	Unkn./Missing	
birth-1.9	118	1,977	83	562	7	27	52	17	7,427	26	1,246	11,542
<i>Pct row</i>	1%	17%	1%	5%	0%	0%	0%	0%	64%	0%	11%	100%
<i>Pct col</i>	5%	29%	2%	2%	4%	5%	3%	7%	25%	3%	3%	9%
2-4.9	66	714	133	1,202	19	39	82	5	3,509	35	1,269	7,073
<i>Pct row</i>	1%	10%	2%	17%	0%	1%	1%	0%	50%	0%	18%	100%
<i>Pct col</i>	3%	10%	4%	3%	10%	7%	5%	2%	12%	3%	3%	5%
5-19.9	182	926	373	7,025	18	107	278	53	4,174	105	8,564	21,805
<i>Pct row</i>	1%	4%	2%	32%	0%	0%	1%	0%	19%	0%	39%	100%
<i>Pct col</i>	7%	14%	11%	20%	9%	20%	16%	21%	14%	10%	17%	17%
20-29.9	539	740	723	5,417	23	100	239	43	3,323	92	9,610	20,849
<i>Pct row</i>	3%	4%	3%	26%	0%	0%	1%	0%	16%	0%	46%	100%
<i>Pct col</i>	22%	11%	22%	16%	12%	18%	13%	17%	11%	9%	19%	16%
30-39.9	576	681	824	6,029	27	96	253	39	3,539	121	7,589	19,774
<i>Pct row</i>	3%	3%	4%	30%	0%	0%	1%	0%	18%	1%	38%	100%
<i>Pct col</i>	23%	10%	25%	18%	14%	18%	14%	16%	12%	12%	15%	15%
40-49.9	524	704	726	5,488	44	79	256	41	3,007	167	7,635	18,671
<i>Pct row</i>	3%	4%	4%	29%	0%	0%	1%	0%	16%	1%	41%	100%
<i>Pct col</i>	21%	10%	22%	16%	23%	14%	14%	17%	10%	16%	15%	14%
50-59.9	252	464	371	3,597	17	44	226	21	1,872	143	5,048	12,055
<i>Pct row</i>	2%	4%	3%	30%	0%	0%	2%	0%	16%	1%	42%	100%
<i>Pct col</i>	10%	7%	11%	10%	9%	8%	13%	8%	6%	14%	10%	9%
60-69.9	143	257	99	2,173	19	17	168	13	1,060	139	2,925	7,013
<i>Pct row</i>	2%	4%	1%	31%	0%	0%	2%	0%	15%	2%	42%	100%
<i>Pct col</i>	6%	4%	3%	6%	10%	3%	9%	5%	4%	14%	6%	5%
≥70	62	392	29	2,931	20	39	220	16	1,448	200	5,555	10,912
<i>Pct row</i>	1%	4%	0%	27%	0%	0%	2%	0%	13%	2%	51%	100%
<i>Pct col</i>	3%	6%	1%	9%	10%	7%	12%	6%	5%	19%	11%	8%
TOTAL	2,462	6,855	3,361	34,424	194	548	1,774	248	29,359	1,028	49,441	12,9694
<i>Pct row</i>	2%	5%	3%	27%	0%	0%	1%	0%	23%	1%	38%	100%
<i>Pct col</i>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

*Total N = 129,694 (Excluding cases where age was not indicated)

Table 6. Lived/Died by Age Group

Age Group	Lived			Died		
	No. of Cases	Pct.	Valid Pct.	No. of Cases	Pct.	Valid Pct.
Birth - 1.9	11,436	8.5	9.3	106	1.4	1.5
2 - 4.9	6,957	5.2	5.7	116	1.5	1.7
5 - 19.9	21,306	15.8	17.3	499	6.6	7.3
20 - 29.9	20,064	14.9	16.3	785	10.4	11.4
30 - 39.9	19,009	14.1	15.5	765	10.1	11.1
40 - 49.9	17,774	13.2	14.5	897	11.9	13.0
50 - 59.9	11,223	8.3	9.1	832	11.0	12.1
60 - 69.9	6,282	4.7	5.1	731	9.7	10.6
≥ 70	8,763	6.5	7.1	2,149	28.4	31.2
Subtotal Valid Cases	122,814	91.1	100.0	6,880	91.0	100.0
Missing	11,940	8.9		684	9.0	
TOTAL	134,754	100.0		7,564	100.0	

Table 7. Lived/Died by Burn Group Size (% TBSA)

%TBSA	Lived			Died		
	No. of Cases	Pct.	Valid Pct.	No. of Cases	Pct.	Valid Pct.
0.1 – 9.9	49,819	37.0	65.8	358	4.7	9.2
10 – 19.9	15,986	11.9	21.1	493	6.5	12.7
20 – 29.9	5,054	3.8	6.7	498	6.6	12.8
30 – 39.9	2,268	1.7	3.0	468	6.2	12.0
40 – 49.9	1,119	0.8	1.5	380	5.0	9.8
50 – 59.9	639	0.5	0.8	388	5.1	10.0
60 – 69.9	353	0.3	0.5	324	4.3	8.3
70 – 79.9	221	0.2	0.3	309	4.1	7.9
80 – 89.9	117	0.1	0.2	272	3.6	7.0
≥90	107	0.1	0.1	398	5.3	10.2
Subtotal Valid Cases	75,683	56.2	100.0	3,888	51.4	100.0
Missing	59,071	43.8		3,676	48.6	
TOTAL	134,754	100.0		7,564	100.0	

Table 8.
Died by % TBSA Thickness Category (Total, Full, Partial)

%TBSA Category	Died		
	No. of Cases	Mean	+/- SEM
% TBSA, Total	3,892	46.10	0.46
% TBSA, Full Thickness	2,836	40.74	0.55
% TBSA, Partial Thickness	2,502	21.69	0.47

Table 9. Lived/Died Distribution for Inhalation Injury

Inhalation Injury	Lived		Died	
	No. of Cases	Pct.	No. of Cases	Pct.
Total Valid Cases (% row)	130,524	94.6	7,467	5.7
Inhalation injury cases (% col)	5,879	4.5	2,041	27.3

Table 10. Lived/Died by Inhalation Injury

Inhalation Injury	Lived			Died		
	No. of Cases	Pct.	Valid Pct.	No. of Cases	Pct.	Valid Pct.
No	124,645	92.5	95.5	5,426	71.7	72.7
Yes	5,879	4.4	4.5	2,041	27.0	27.3
Subtotal	130,524	96.9	100.0	7,467	98.7	100.0
Missing	4,230	3.1		97	1.3	
Total	134,754	100.00		7,564	100.00	

Table 11. Mortality Rate by Age Group and Burn Size*
(expressed as the number of deaths over the total number of patients in that group)

Age Group	Burn Size (% TBSA)										Total
	0.1-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	≥90	
birth - 1.9	0.0%	0.1%	2.0%	4.4%	7.0%	9.8%	59.1%	42.1%	58.8%	60.0%	0.54%
Died/Total	2/7284	3/2009	8/399	7/158	5/71	5/51	13/22	8/19	10/17	3/5	64/10035
2 - 4.9	0.1%	0.1%	2.7%	5.4%	7.8%	11.1%	20.6%	35.3%	52.2%	65.0%	1.21%
Died/Total	5/3765	1/1117	9/335	9/167	6/77	6/54	7/34	12/34	12/23	13/20	80/5626
5 - 19.9	0.1%	0.2%	1.3%	3.3%	7.4%	9.0%	16.3%	22.8%	42.4%	54.9%	1.38%
Died/Total	11/8009	4/2521	11/867	14/427	17/230	14/155	20/123	18/79	25/59	39/71	173/12541
20 - 29.9	0.2%	0.7%	2.2%	3.5%	11.7%	16.7%	34.8%	46.2%	62.3%	73.4%	2.33%
Died/Total	11/6286	15/2105	16/738	12/345	24/206	22/132	31/89	24/52	33/53	47/64	235/10070
30 - 39.9	0.3%	0.8%	4.1%	8.1%	13.9%	30.8%	39.6%	55.9%	67.7%	82.4%	3.48%
Died/Total	20/6520	18/2343	33/805	34/421	32/231	45/146	38/96	52/93	42/62	61/74	375/10791
40 - 49.9	0.6%	1.3%	5.3%	15.8%	27.8%	39.7%	48.1%	58.3%	77.6%	86.7%	4.90%
Died/Total	34/5984	27/2034	40/760	61/386	62/223	56/141	50/104	42/72	38/49	72/83	482/9836
50 - 59.9	1.0%	3.2%	10.6%	24.5%	38.1%	57.4%	73.0%	80.9%	78.9%	83.9%	7.83%
Died/Total	37/3646	41/1264	56/527	65/265	56/147	62/108	46/63	38/47	30/38	52/62	483/6167
60 - 69.9	2.3%	8.3%	18.4%	38.7%	63.6%	75.0%	74.2%	89.7%	88.0%	76.1%	12.48%
Died/Total	46/1968	68/815	67/364	55/142	49/77	45/60	23/31	35/39	22/25	35/46	445/3567
≥70	7.2%	26.1%	52.2%	69.9%	80.0%	93.3%	97.3%	87.0%	94.4%	95.8%	27.27%
Died/Total	177/2466	287/1101	211/404	179/256	104/130	112/120	73/75	60/69	34/36	46/48	1283/4705
Total	0.7%	3.0%	8.7%	17.0%	25.5%	38.0%	47.3%	57.3%	68.0%	77.8%	4.94%
Died/Total	343/45928	464/15309	451/5199	436/2567	355/1392	367/967	301/637	289/504	246/362	368/473	3620/73338

*Total N = 73,338 (Excluding cases where age was not indicated)

Table 12. Procedures: Total and Top Ten

Procedures	No. of Cases
Total patient cases	142,318
Total no. of procedure records	332,362
No. of patients with at least 1 procedure	77,386
Top Ten Procedure Codes	
86.22 Excisional Debridement of Wound, Infection, or burn	45,863
86.69 Other Skin Graft to Other Sites	32,161
93.57 Application of Other Wound Dressing	12,821
38.93 Venous Catheterization, not elsewhere classified	11,888
86.28 Nonexcisional Debridement of Wound, Infection, or Burn	10,549
99.99 Other Miscellaneous Procedures	9,943
86.66 Homograft to Skin	9,408
86.59 Suture of Skin and Subcutaneous Tissue of Other Sites	8,097
96.04 Insertion of Endotracheal Tube	6,923
38.91 Arterial Catheterization	6,424
TOTAL	154,077

Table 13. Complications: Total and Top Ten

Complications		No. of Cases
Total no. of patient cases		142,318
Total no. of complications records		44,884
No. of patients with at least 1 complication		20,450
Top Ten Complications/Condition Codes		
3008	Pneumonia	3,361
9001	Delay In Disposition	2,853
2001	No Ems Form	2,043
5501	Cellulitis/Traumatic Injury	1,988
5509	Wound Infection	1,950
3015	Respiratory Failure	1,944
8599	Other Miscellaneous	1,709
5507	Septicemia	1,672
5599	Other Infection	1,250
3002	Acute Respiratory Distress Syndrome	885
TOTAL		19,655

Table 14. Hospital Days: Lived/Died by Inhalation Injury

Inhalation Injury	Total			Lived			Died		
	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM
No	130,071	8.06	0.04	124,645	7.96	0.04	5,426	10.44	0.29
Yes	7,920	24.32	0.38	5,879	27.84	0.47	2,041	14.20	0.59
Subtotal	137,991			130,524			7,467		
Missing	4,327	6.29	0.13	4,230	6.37	0.14	97	2.53	0.45
TOTAL	142,318			134,754			7,564		

Table 15. Hospital Days: Lived/Died by Burn Size Group (% TBSA)

%TBSA	Total			Lived			Died		
	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM
0.1 - 9.9	50,177	5.82	0.05	49,819	5.75	0.05	358	15.32	0.99
10 - 19.9	16,479	11.78	0.11	15,986	11.44	0.10	493	22.86	1.28
20 - 29.9	5,552	21.37	0.29	5,054	21.40	0.28	498	21.12	1.49
30 - 39.9	2,736	29.70	0.51	2,268	32.07	0.55	468	18.21	1.14
40 - 49.9	1,499	36.44	0.86	1,119	43.15	1.01	380	16.65	1.18
50 - 59.9	1,027	37.37	1.25	639	51.10	1.53	388	14.75	1.57
60 - 69.9	677	38.87	1.69	353	60.98	2.45	324	14.79	1.40
70 - 79.9	530	35.79	2.13	221	68.44	3.72	309	12.44	1.43
80 - 89.9	389	37.01	3.51	117	95.07	8.71	272	12.04	1.91
≥ 90	505	19.65	2.41	107	66.88	9.31	398	6.95	1.11
Subtotal	79,571	10.67	0.07	75,683	10.39	0.07	3,888	16.08	0.44
Missing	62,747	6.69	0.05	59,071	6.71	0.05	3,676	6.35	0.26
TOTAL	142,318			134,754			7,564		

Table 16. Primary Insurance Payor

Insurance	No. of Cases	Pct.
Government-Medicaid	19,478	
Government-Medicare	11,876	
Government-Military/Indian Health	1,634	
Subtotal	32,988	23.2
Private-Employer	3,120	
Private-Foundation/Charity	2,554	
Subtotal	5,674	4.0
Other Insurance-Not Named	12,701	
Other Named Insurance Plan	1,066	
Subtotal	13,767	9.7
Worker's Compensation	11,508	8.1
Managed Care	14,586	10.2
No Insurance Information	29,210	
Self Pay	16,201	
Uninsured	2,730	
Private Pay	1,205	
Subtotal	49,346	34.7
Auto	6,935	4.9
Unidentified Insurance Labels	7,514	5.3
TOTAL	142,318	100.0

Table 17. DRG Codes: Top 20

DRG Code and Description	No. of Cases	Pct.	Valid Pct.
511 Non-extensive burns w/o cc or significant trauma	16,840	11.8	19.2
507 Full thickness burn with skin graft or inhalation injury w/o cc or sig trauma	4,946	3.5	5.6
506 Full thickness burn with skin graft or inhalation inj with cc or sig trauma	3,583	2.5	4.1
510 Non-extensive burns with cc or significant trauma	3,545	2.5	4.0
504 Extensive 3rd degree burns with skin grafts	2,414	1.7	2.7
486 Other O.R. Procedures for multiple sig trauma	2,082	1.5	2.4
487 Other multiple significant trauma	1,591	1.1	1.8
509 Full thickness burn w/o skin graft or inh inj w/o cc or sig trauma	1,441	1.0	1.6
219 Lower extrem & humer proc except hip, foot, femur age>17 w/o cc	992	0.7	1.1
508 Full thickness burn w/o skin graft or inh inj w cc or sig trauma	725	0.5	0.8
217 Wnd debrid & skin graft except hand, for muscskel & conn tiss dis	718	0.5	0.8
445 Traumatic injury, age > 17 w/o cc	712	0.5	0.8
243 Medical back problems	706	0.5	0.8
881 Other code not currently available in this list	656	0.5	0.7
210 Hip & femur proc except major joint age >17 w cc	606	0.4	0.7
505 Extensive burns of full thick burns w/mech vent 96+ hrs w/skin graft	554	0.4	0.6
218 Lower extreme & humer proc except hip, foot, femur age >17 w/ cc	553	0.4	0.6
281 Trauma to skin, subcu tissue & breast, age > 17 w/o cc	548	0.4	0.6
485 Limb reattachment, hip & femur proc for multiple significant trauma	529	0.4	0.6
28 Traumatic stupor & coma, coma < 1 hr, age > 17 w/cc	519	0.4	0.6
Subtotal Top 20	44,260	31.1	50.4
Other DRGs	15,401	10.8	17.5
No Longer Valid Codes	28,175	19.8	32.1
Missing	54,482	38.3	
TOTAL	142,318	100.0	

Table 18. Hospital Charges

Statistic	Hospital Charges	Pct.
Missing Cases	83,435	48.6
No. of Valid Cases	58,883	41.4
Mean	\$52,680.00	
+/- SEM	\$627.73	
Median	\$17,327.00	
Minimum	\$1	
Maximum	\$10,421,022.00	

Table 19. Hospital Charges: Lived/Died by Burn Size Group (% TBSA)

% TBSA Group	Total			Lived			Died		
	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM
0.1 - 9.9	16,948	\$23,278	\$471	16,814	\$22,496	\$410	134	\$121,418	\$28,897
10 - 19.9	5,961	\$62,400	\$2,111	5,781	\$58,946	\$2,078	180	\$173,333	\$19,183
20 - 29.9	2,173	\$131,513	\$5,608	1,973	\$125,622	\$5,834	200	\$189,629	\$19,567
30 - 39.9	964	\$227,643	\$13,486	794	\$237,908	\$15,823	170	\$179,698	\$19,317
40 - 49.9	499	\$281,906	\$13,757	361	\$310,274	\$16,098	138	\$207,696	\$25,507
50 - 59.9	328	\$320,385	\$22,784	197	\$430,260	\$32,930	131	\$155,153	\$21,476
60 - 69.9	225	\$376,787	\$27,418	114	\$570,045	\$40,887	111	\$178,305	\$25,148
70 - 79.9	167	\$436,642	\$67,940	56	\$987,048	\$170,886	111	\$158,959	\$31,989
80 - 89.9	122	\$318,179	\$56,371	30	\$758,134	\$185,501	92	\$174,715	\$33,277
≥ 90	159	\$143,190	\$36,224	35	\$293,664	\$83,836	124	\$100,717	\$39,324
Subtotal	27,546	\$63,049	\$1,177	26,155	\$57,573	\$1,152	1,391	\$166,018	\$8,110
Missing	31,337	\$43,566	\$558	29,452	\$41,116	\$524	1,885	\$81,848	\$4,243
TOTAL	58,883			55,607			3,276		

Table 20. Charges: Lived/Died by Top 20 DRGs

Top 20 DRG Codes – All Records	Total			Lived			Died		
	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM	No. of Cases	Mean	+/- SEM
511 Non-extensive burns w/o cc or significant trauma	7,877	\$14,704	\$727	7,852	\$14,419	\$709	25	\$104,201	\$51,465
507 Non-extensive burns with cc or significant trauma	2,134	\$73,013	\$6,201	2,124	\$72,405	\$6,209	10	\$202,093	\$104,740
510 Full thickness burn with skin graft or inhalation injury w/o cc or sig trauma	2,059	\$47,212	\$1,988	1,984	\$44,069	\$1,858	75	\$130,346	\$21,799
506 Full thickness burn with skin graft or inhalation inj with cc or sig trauma	2,009	\$121,623	\$4,382	1,882	\$116,165	\$3,816	127	\$202,506	\$39,566
504 Extensive 3rd degree burns with skin grafts	1,024	\$237,158	\$11,827	859	\$227,282	\$12,373	165	\$288,573	\$35,016
486 Other O.R. Procedures for multiple sig trauma	926	\$90,752	\$3,296	783	\$92,941	\$3,489	143	\$78,769	\$9,488
509 Non-extensive burns with wound debridement or other O.R. proc	788	\$16,625	\$930	778	\$16,746	\$941	10	\$7,244	\$1,061
219 Other multiple significant trauma	650	\$26,317	\$656	649	\$26,333	\$657	1	\$15,827	-
487 Full thickness burn w/o skin graft or inh inj w/o cc or sig trauma	588	\$34,904	\$1,011	507	\$33,960	\$1,092	81	\$40,807	\$2,603
217 Wnd debrid & skin graft except hand, for musc skelet & conn tiss dis	524	\$83,270	\$4,741	515	\$79,989	\$3,366	9	\$271,025	\$198,572
210 Hip & Femur procedures except major joint age>17 w cc	446	\$56,254	\$7,630	431	\$54,261	\$7,854	15	\$113,513	\$18,297
508 Full thickness burn w/o skin graft or inh inj w cc or sig trauma	400	\$35,995	\$3,068	353	\$34,145	\$3,310	47	\$49,887	\$7,756
485 Limb reattachment, hip & femur proc for multiple significant trauma	392	\$106,174	\$4,384	376	\$105,506	\$4,437	16	\$121,869	\$26,278
881 Other code not currently available in this list	379	\$40,802	\$4,426	355	\$31,730	\$3,315	24	\$174,989	\$41,805
218 Lower extreme & humer proc except hip, foot, femur age >17 w/ cc	348	\$43,440	\$1,332	346	\$43,235	\$1,331	2	\$78,926	\$9,745
243 Medical back problems	330	\$18,908	\$1,142	326	\$18,057	\$1,065	4	\$88,221	\$13,211
211 Hip & femur proc except major joint proc, age > 17 w/o cc	322	\$28,438	\$849	322	\$28,438	\$849	-	-	-
28 Traumatic stupor & coma, coma < 1 hr, age > 17 w/cc	298	\$35,351	\$2,994	282	\$35,529	\$3,150	16	\$32,205	\$5,507
505 Extensive burns of full thick burns w/mech vent 96+ hrs w/skin graft	286	\$55,280	\$7,386	50	\$106,172	\$36,340	236	\$44,498	\$4,361
27 Traumatic stupor & coma, coma > 1 hr	276	\$31,642	\$1,446	204	\$33,167	\$1,880	72	\$27,321	\$1,438
Subtotal	22,056	\$54,253	\$1,065	20,978	\$50,914	\$1,031	1,078	\$119,224	\$8,285
Other Valid DRG Codes	16,944	\$33,151	\$597	15,903	\$31,289	\$575	1,041	\$61,593	\$4,046
No Longer Valid DRG Codes	11,548	\$80,939	\$1,880	10,813	\$72,466	\$1,813	735	\$205,580	\$11,776
Missing	8,335	\$49,069	\$1,781	7,913	\$46,445	\$1,805	422	\$98,271	\$9,313
TOTAL	58,883			55,607			3,276		

Table 21. Days per % TBSA and Charges per Day by Age Group and Survival
(mean and +/- standard error of the mean)

Age Groups	No. of Cases		Days		Days / %TBSA		Hospital Charges (\$)		Hospital Charges / Days (\$)	
	Lived	Died	Lived	Died	Lived	Died	Lived	Died	Lived	Died
birth - 1.9	2,586	18	6.02	8.39	1.20	0.29	26,493	95,973	3,733	16,827
+/- SEM			0.17	3.34	0.05	0.12	2,210	30,614	195	3,652
2 - 4.9	1,498	13	7.92	8.46	1.32	0.12	33,747	108,333	3,446	12,146
+/- SEM			0.28	4.43	0.07	0.05	2,122	65,799	96	1,817
5 - 19.9	3,801	45	9.00	11.20	1.23	0.31	47,768	138,698	4,184	13,878
+/- SEM			0.24	2.94	0.03	0.11	3,377	32,399	351	1,159
20 - 29.9	4,059	88	9.92	16.40	1.44	0.35	58,316	239,842	4,259	15,754
+/- SEM			0.27	3.13	0.04	0.06	2,782	56,985	144	1,237
30 - 39.9	4,221	129	10.57	13.67	1.61	0.60	59,842	193,033	4,412	15,570
+/- SEM			0.26	1.74	0.05	0.11	2,756	27,313	136	924
40 - 49.9	3,888	177	12.35	18.78	1.70	0.55	73,884	239,781	4,793	15,042
+/- SEM			0.31	2.01	0.05	0.07	3,525	30,184	201	1,258
50 - 59.9	2,236	201	13.39	17.40	2.12	0.72	77,467	179,509	4,658	13,507
+/- SEM			0.40	2.35	0.09	0.10	5,858	19,688	260	862
60 - 69.9	1,214	180	15.08	20.28	2.44	1.56	78,620	200,691	4,601	9,983
+/- SEM			0.60	2.02	0.14	0.31	4,330	27,153	246	479
≥70	1,329	493	16.64	12.88	3.04	1.08	89,407	108,491	4,816	9,546
+/- SEM			0.51	0.81	0.21	0.17	4,345	7,615	220	513
TOTAL	24,832	1,344	10.67	15.47	1.64	0.88	58,983	166,308	4,336	12,173
+/- SEM			0.11	0.66	0.02	0.08	1,207	8,341	79	327

Note: Causes were selected if they had valid data for each category: hospital days, %TBSA, and hospital charges. This ratio (days/%TBSA) has been used previously to indicate the efficiency of burn care; a ratio below 1.0 has been quoted as a goal for burn treatment.

Appendix A

The following is a list of hospitals that have contributed to the NBR in any given year. We extend our thanks for their contribution and ongoing support of this endeavor.

Alabama

UAB Burn Center
University of South Alabama Regional Burn and Wound Center

Arizona

Arizona Burn Center at Maricopa Medical Center

Arkansas

Arkansas Children's Hospital Burn Center

California

Arrowhead/Inland Counties Regional Burn Center
Bothin Burn Center St. Francis Memorial Hospital
Community Regional Burn Center
Southern California Regional Burn Center at LAC & USC Medical Center
Santa Clara Valley Medical Center Regional Burn Center
Shriners Hospital for Children, Northern California
The Grossman Burn Center – Santa Ana
Torrance Memorial Burn Center
UC Davis Regional Burn Center
UCI Regional Burn Center
UCSD Regional Burn Center

Colorado

University of Colorado Hospital Burn Center
Western States Burn Center, North Colorado Medical Center

District of Columbia

The Burn Center at Washington Hospital Center

Florida

Orlando Regional Medical Center
Shands Burn Center at the University of Florida
Tampa Bay Regional Burn Center
University of Miami Jackson Memorial Burn Center

Georgia

The Joseph M. Still Burn Center at Doctor's Hospital

Illinois

Loyola University Medical Center
Sumner L. Koch Burn Center Stroger Hospital
University of Chicago Burn Center

Indiana

Regional Hospital
St. Joseph's Burn Center
Wishard Health Services

Iowa

University of Iowa Burn Center

Kansas

Burnett Burn Center Kansas University Hospital
Via Christi Regional Medical Center Burn Center

Louisiana

Louisiana State University Health Sciences Center-Shreveport

Maryland

Johns Hopkins Bayview Medical Center Baltimore Regional Burn Center

Massachusetts

Sumner Redstone Burn Center Massachusetts General Hospital
Shriners Hospital for Children, Boston

Michigan

Blodgett Hospital
Children's Hospital of Michigan
Detroit Receiving Hospital Burn Center
Detroit Receiving – Children's Hospital of Michigan
Spectrum Health Regional Burn Center
University of Michigan Health Systems

Minnesota

Miller Dwan Burn Center
Regions Hospital Burn Center

Mississippi

Delta Regional Medical Center

Missouri

George David Peak Memorial Burn Care Center
University of Missouri

Nebraska

Nebraska Health Center Clarkson Hospital Burn Center
St Elizabeth Regional Burn Center

Nevada

Lion's Burn Center University Medical Center

New Jersey

Saint Barnabas Burn Center

New York

Clark Burn Center University Hospital

Nassau University Medical Center Burn Center

Strong Regional Burn Center Strong Memorial Hospital University of Rochester

Westchester Medical Center Burn Center

William Randolph Hearst Burn Center New York Presbyterian Hospital Weill Cornell Medical Center

North Carolina

North Carolina Jaycee Burn Center University of North Carolina Hospitals

Wake Forest University Baptist Medical Center Burn Center

Ohio

Children's Hospital Medical Center of Akron CR Boeckman Regional Burn Center

MetroHealth Medical Center

Shriners Hospital for Children, Cincinnati

The University Hospital Burn Center, Cincinnati

Oregon

Legacy Emanuel

Oregon Burn Center

Tennessee

Erlanger Health Systems Burn Center

Vanderbilt University Burn Center Vanderbilt University Medical Center

Texas

Parkland Memorial Hospital Regional Burn Center

Shriners Hospital for Children, Galveston

Timothy J. Harnar Burn Center

University of Texas Medical Branch Blocker Burn Center

U.S. Army Institute of Surgical Research

Utah

University of Utah Hospital Burn Center

Washington

University of Washington Burn Center Harborview Medical Center

Wisconsin

University of Wisconsin Hospitals and Clinics Burn Center

Canada

Firefighter's Burn Treatment Unit University of Alberta Hospital, Edmonton, Alberta

Hamilton Firefighters Burn Unit Hamilton Health Sciences, Hamilton, Ontario

Hospital for Sick Children, Toronto, Ontario

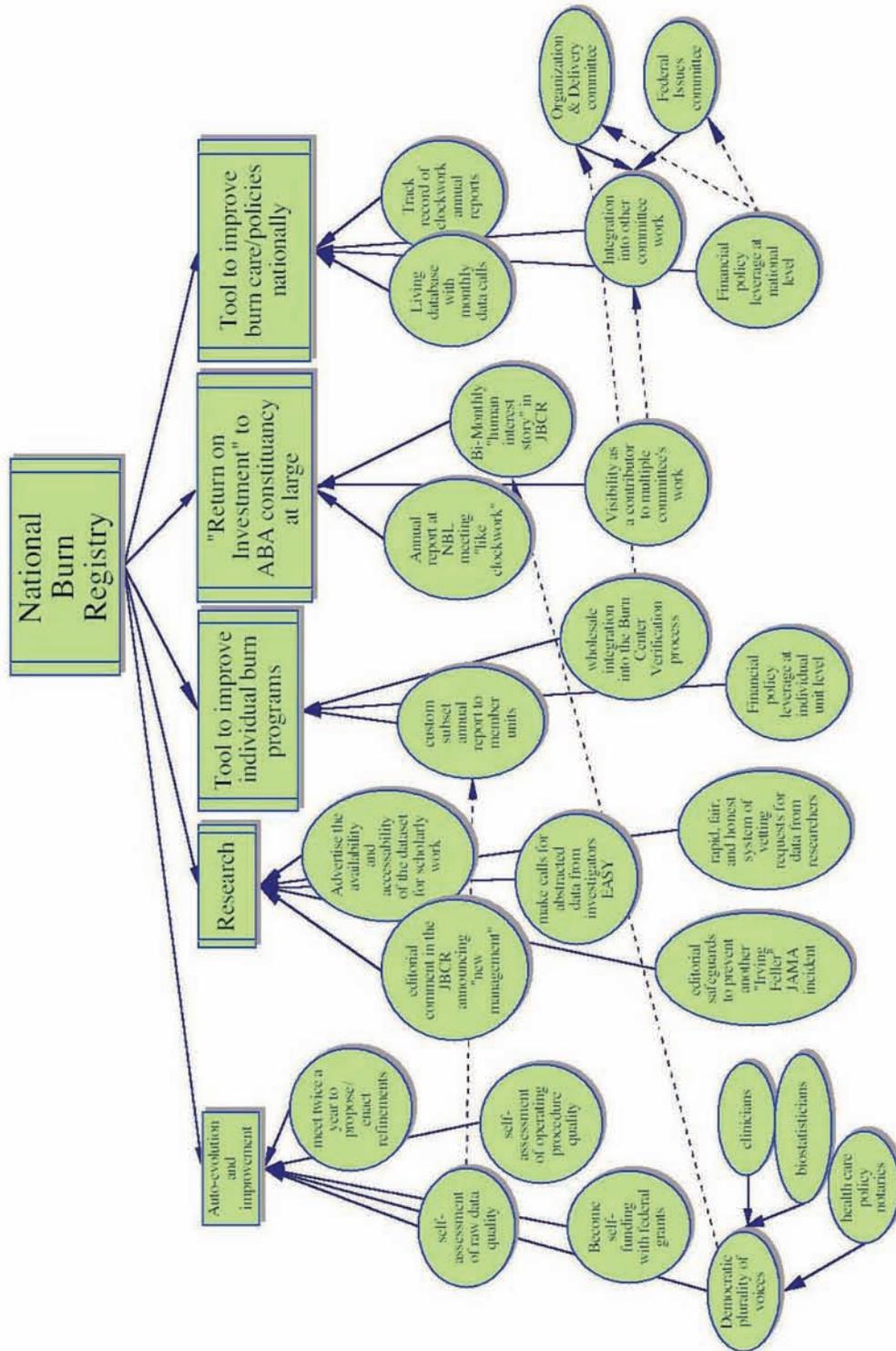
Ross Tilley Burn Centre Sunnybrook Health Sciences Centre, Toronto, Ontario

The following 12 states have self-designated burn centers (as indicated in the ABA *Burn Care Resources in North America publication*) but have not yet contributed to the NBR:

Alaska
Connecticut
Hawaii
Kentucky
Maine
New Mexico

Oklahoma
Pennsylvania
South Dakota
Vermont
Virginia
West Virginia

NBR Roadmap



“Open for Business!” A Primer on the Scholarly Use of the National Burn Repository

James C. Jeng, MD, for the Advisory Committee to the National Burn Repository

With this current issue of the *Journal of Burn Care and Research*, the first of six bimonthly “factoids” abstracted from the National Burn Repository (NBR) is being rolled out. They are titled “NBR Glimmers” in the spirit that they are not meant to be rigorous examinations of their deliberately provocative topics. Rather, their true purpose is to stimulate the readership to delve into follow-on, expanded, and scholarly research based on the NBR. The arrival of this series of NBR Glimmers also heralds the fact that our nationwide database in excess of 186,000 separate admissions is truly “open for business.”

The current editorial is meant to be a primer to the uninitiated in the use of this collective resource. A decade ago, one of us (JCJ) thought to query the NBR and found the process as intimidating as confronting a giant, seamless monolith. It is crucial for the Advisory Committee to the NBR to ensure that thoughtful querying of our database is as accessible and user-friendly as possible.

To that end, requests for permission to query the NBR are now available for download electronically on the first page of the American Burn Association (ABA) Web portal (www.ameriburn.org). Additionally, we are anxious to evolve this application process into a wholly on-line endeavor so that the pertinent information can be filled out and submitted for review entirely through the ABA Web site. A brief graphic overview of the entire application process is presented in Figure 1.

A proper discussion should be had concerning the rationale for burn community members to pursue scholarly work based on the NBR. First and foremost, database science in general is now solidly out of its infancy. Much has been learned about the strengths and limitations of data mining. Thoughtfully performed research based on this type of science should be assigned appropriate gravitas.

From the Washington Hospital Center, Washington, DC.

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Burn prevention efforts have been very successful over the life of the ABA, resulting in an era in which very large injuries are admitted infrequently to even the largest burn centers. We also deal with several pathologic conditions (e.g., Stevens Johnson syndrome) or complications (e.g., hepatic insufficiency following burns) whose incidence is too low for anything other than a nationwide registry to lend authoritative commentary. The remedy to studying these low-incidence phenomena is collective work: the ABA Multi-Center Trials Group is the prospective arm, and the NBR is the retrospective arm.

This database is a living, growing entity. Our own experience with the dataset has underscored many frustrating, yet surmountable difficulties in its actual employment. Therefore, several important evolutions are being pursued concurrently: a) folding in new data now occurs annually; b) an annual report including that year’s fresh data will be disseminated at the ABA meeting each Spring; c) standardization of “field entries” will revolve around a data dictionary and “drop down” menus in the data collection tool; d) the primary focus of future data collection is tilting away from quantity toward quality; e) participation in the NBR is a requirement for ABA-ACS burn center verification; and f) a new and highly improved data collection tool and electronic submission facility was rolled out at the end of 2006.

Rocks and shoals! Data mining and database science must be treated and handled with great respect. Just within our own field of burn care, there have been historic moments when well-intentioned work has been taken so far out of context as to be harmful to the collective mission. The data in the NBR is voluntarily contributed by our members. Each and every one of us is thus obligated to ensure that its collaborative use represents a *positive* return on this investment.

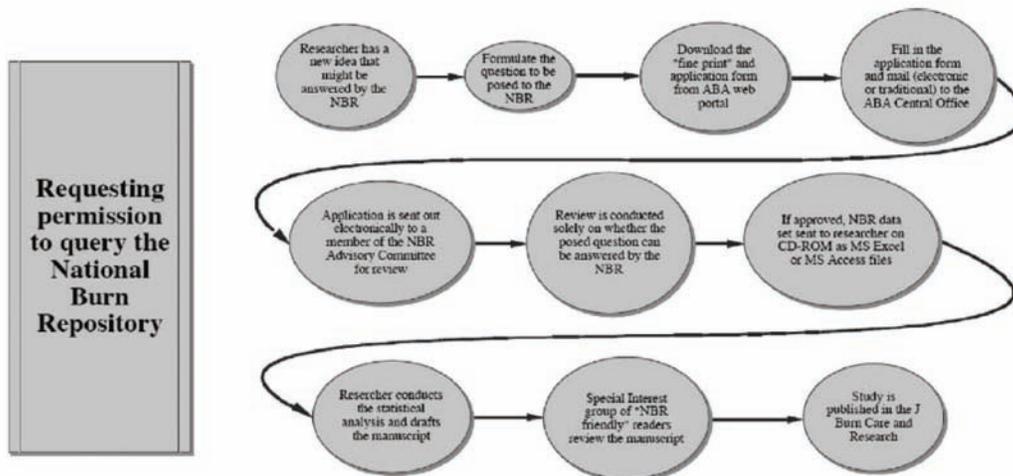


Figure 1. Overview of the National Burn Repository query process.

In approving requests for queries of the NBR, the Advisory Committee has decided to assume no “editorial” function. Permission to use the dataset is based solely on feasibility of the proposed project. Although not an absolute requirement, researchers using the NBR data should see the strong wisdom in publishing their work with the *Journal of Burn Care and Research*. Indeed, so that things are not taken out of context, vetting by a “sentient” editorial board seems nearly compulsory. We call upon the editorial board of the journal to gather a group of readers with a special interest in friendly, constructive, proactive review of these manuscripts.

Finally, the promotion of the NBR as a vehicle for collaborative, scholarly work does not end here. The Advisory Committee is reaching out beyond the confines of the burn community in search of novel interpretations of the messages locked up in our database. The possibility exists to recruit collaboration from schools of public health, engineering, mathematics, economics, and computer science, as well as the national research laboratories, which might just shed a unique and previously unappreciated light upon the complex history residing in our NBR. Every consideration will be given to direct these potential partnerships back to our local member burn units.

Selected List of Peer-reviewed Publications Utilizing NBR Data

Jeng JC; Advisory Committee to the National Burn Repository. "Open for business!" a primer on the scholarly use of the National Burn Repository. *J Burn Care Res.* 2007 Jan-Feb;28(1):143-4.

Jeng JC, Miller SF. From the burn unit's perspective, it's lethal not being gainfully employed outside the home! A glimmer from the National Burn Repository. *J Burn Care Res.* 2007 Jan-Feb;28(1):142.

Kagan RJ, Gamelli R, Kemalyan N, Saffle JR. Tracheostomy in thermally injured patients: does diagnosis-related group 483 adequately estimate resource use and hospital costs? *J Trauma.* 2004 Oct;57(4):861-6.

Kerby JD, McGwin G Jr, George RL, Cross JA, Chaudry IH, Rue LW 3rd. Sex differences in mortality after burn injury: results of analysis of the National Burn Repository of the American Burn Association. *J Burn Care Res.* 2006 Jul-Aug;27(4):452-6.

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Moss LS. Outpatient management of the burn patient. *Crit Care Nurs Clin North Am.* 2004 Mar;16(1):109-17. Review.

Santaniello JM, Luchette FA, Esposito TJ, Gunawan H, Reed RL, Davis KA, Gamelli RL. Ten year experience of burn, trauma, and combined burn/trauma injuries comparing outcomes. *J Trauma.* 2004 Oct;57(4):696-700; dicussion 700-1.



American Burn Association
625 N. Michigan Ave., Ste. 2550
Chicago, IL 60611
(312) 642-9260

The complete National Burn Repository Report 2006 is available at the ABA website at:
www.ameriburn.org.