

# Sociodemographic Patterns of Pediatric Patients in Specialized Burn Care in Sweden

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**Background:** Trauma is a leading cause of mortality in children. Burns affect children disproportionately. Although burn incidence and mortality are decreasing, differences in the risk depend on socioeconomic status. The present study aimed to investigate the sociodemographic patterns of pediatric patients (0–17 years) managed at the two burn centers in Sweden, Uppsala, and Linköping, between 2010 and 2020.

**Method:** This retrospective register-based study used hospital records from the two burn centers combined with information from Statistics Sweden plus data regarding number of asylum seekers from the Swedish Migrations Agency. Choropleth maps representing the patients' geographical distribution were created. Information about income levels per geographic area was added. A Wilcoxon signed-rank test was performed to investigate differences in median income levels between the areas where the patients lived, related to Sweden's median income.

**Results:** The study included 2455 patients. Most of the children aged below 5 years (76%) and were boys (60%). The mean percentage of total skin area was 4.2%. There was no significant increment or decrease in the incidence of pediatric burns during the study. Most patients with recorded zip codes lived in areas with an income level below the national median (n = 1974, 83%). Children with asylum status were over-represented compared with residents and/or Swedish citizens.

**Conclusions:** In Sweden, most pediatric burns occur in families that live in areas with low-income levels. Pediatric burns affect children with asylum status disproportionately compared with those who are residents in and/or citizens of Sweden. Prevention strategies should be designed and implemented to alleviate this health inequity. (*Plast Reconstr Surg Glob Open* 2022;10:e4246; doi: 10.1097/GOX.0000000000004246; Published online 28 April 2022.)

## INTRODUCTION

Childhood injury constitutes a large burden of disease globally. Each year, 950,000 children die due to injuries,

and they are the leading cause of death in children aged between 10 and 19 years.<sup>1,2</sup> Burns are a group of injuries that disproportionately affect children, who are at higher risk of severe burns than adults are.<sup>2</sup> For several types of childhood injury, including burns, there is an association between socioeconomic status and risk of injury.<sup>3–12</sup>

In most high-income countries, burn incidence has become lower over time.<sup>13,14</sup> In Sweden, it diminished by 45% between 1987 and 2010.<sup>15</sup> Prevention strategies such as fire detectors, electrical safety, water temperature regulation, and safer buildings have contributed to this positive development.<sup>16</sup>

Sweden is a high-income country where healthcare is publicly funded to 80%.<sup>17</sup> Children up to 18 years old are exempt from patient fees.<sup>18</sup> The country had 10.4 million inhabitants in 2020.<sup>19</sup> Since 2010, two centers have provided specialized burn care resembling the European Burns Association's referral criteria.<sup>20</sup> From 2010 and

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onward, both centers have noted an increasing number of pediatric burns presenting at the centers, contrary to the overall reduced national burn incidence. This concern warranted further investigation. The primary aim of this study was to investigate the temporal trend of pediatric burn incidence at the two Swedish burn centers between 2010 and 2020. The secondary aim was to further identify the children affected by burns and to investigate the potential association with socioeconomic factors.

## METHOD

This retrospective study was based on combined burn registry data, with hospital records from the two burn centers in Sweden (Uppsala and Linköping), information from Statistics Sweden about median income, and data from the Swedish Migration Agency regarding the number of asylum seekers.<sup>23</sup>

All children (0–17 years) who had presented to outpatient clinics or who had been admitted to either of the burn centers between January 1, 2010 and August 31, 2020 were included in the study. The referral criteria to the burn centers in Sweden depend on the depth of burn, %TBSA, or specific locations such as genitalia or face. These referral criteria are presented in SDC 1. (**See appendix, Supplemental Digital Content 1, which displays the referral criteria to a Swedish burn center.** <http://links.lww.com/PRSGO/B991>.)

Data were retrieved from registries at each unit and included the patients' age, sex, type of burn (scald, contact burn, flame etc.), percentage of total body surface area burned (% TBSA), and if the patients were managed as in- or outpatients. The estimation of %TBSA was done by our burn specialists using the “rule of palm,” “rule of nines” and “Lund and Browder chart.” Patient files were reviewed to access the zip code of each patient's residence at the time of the injury. Sociodemographic data were extracted from Statistics Sweden in demographic statistical areas (DeSOs).<sup>21–25</sup>

DeSOs are geographically defined areas that are slightly bigger than zip codes.<sup>22</sup> There are 5984 DeSOs in Sweden, each housing between 700 and 2700 inhabitants.<sup>24</sup> Each patient included in the study was mapped by their zip code using the ArcGIS (Esri Inc, USA) online mapping software for geographical data. The geographical locations of the patients' zip codes were entered into an ArcGIS map, which was thereafter used to define the DeSO in which each patient lived. The median income in each concerned DeSO was openly available from Statistics Sweden.<sup>26</sup> Data regarding the number of asylum seekers during the study period were collected from the Swedish Migration Agency.<sup>24</sup>

All statistical analyses were performed using SPSS® Software (IBM Corp., Armonk, USA, 2019, version 27). Descriptive statistics was used to show the basic characteristics of the patients. To investigate whether there had been an increase in admissions, a regression analysis was done, but only with data from the years 2013–2019 because outpatient data in Uppsala were missing from January 2010 to

## Takeaways

**Question:** To investigate the temporal trend of pediatric burn incidence at the two Swedish burn centers between 2010 and 2020, due to an increased number of pediatric burns presenting at the centers.

**Findings:** A retrospective study combined burn registry data from the two burn centers. We found that most of the patients lived in a geographic area below the national median income level ( $n = 1974$ , 83%), and asylum seekers were over-represented.

**Meaning:** Children living in areas with an income level lower than the median and asylum seekers are over-represented at the two burn centers. Prevention strategies should be designed and implemented toward this group in the future to prevent pediatric burns.

August 2012. To adjust for population growth during the study, data from Statistics Sweden were collected for the number of inhabitants aged 0–17 years for each year during the study period.<sup>25</sup> The Wilcoxon signed-rank test was used for comparisons of socioeconomic status. A  $P$  value less than 0.05 was considered statistically significant.

The study was approved by the Swedish Ethical Review Authority (Dnr: 2020-03726).

## RESULTS

A total of 2455 patients were included in the study. Their basic characteristics are shown in [Table 1](#). The majority ( $n = 1862$ , 76%) were children below 5 years, and 1473 (60%) were boys. Overall, the mean %TBSA was 4.2% (SD = 6.8); for inpatients it was 8.5% (SD: 8.9, range: <0%–100%), and for outpatients 1.4% (SD: 2.0, range <0%–26%). During the period 2013–2019, there was no statistically significant change of burn incidence per 100,000 pediatric population in Sweden ( $P = 0.843$ ) ([Table 2 Fig. 1](#)).

Data on zip codes were available for 2370 patients (96.5%), whereas 85 patients lacked a registered zip code because of protected identity, no registered home address, or because they lived in another country. [Figure 2](#) shows the geographical distribution of the patients, nationally and for Sweden's five largest cities. Among the patients with a recorded zip code, residence in an area with an income level below the national median was over-represented ( $n = 1974$ , 83%,  $z = 33.596$ ,  $N - \text{Ties} = 2455$ ,  $P < 0.001$ ).

A subgroup of patients ( $n = 156$ , 6.4%) had temporary ID numbers. Temporary IDs are given at the hospital for patients with no residency in Sweden, such as asylum seekers and tourists. Of these, 120 were registered as asylum seekers or without documents, 20 were tourists, and for the remaining 16, information was missing. Asylum seekers were over-represented compared with children resident in Sweden (RR = 9.6). The majority ( $n = 126$ , 80.1%) of these children were younger than 5 years. Of patients with temporary ID numbers, 51% required hospitalization compared with 35% for the group with permanent ID numbers. Among the patients registered as asylum

**Table 1. Basic (Demographic) Characteristics of the Study Population**

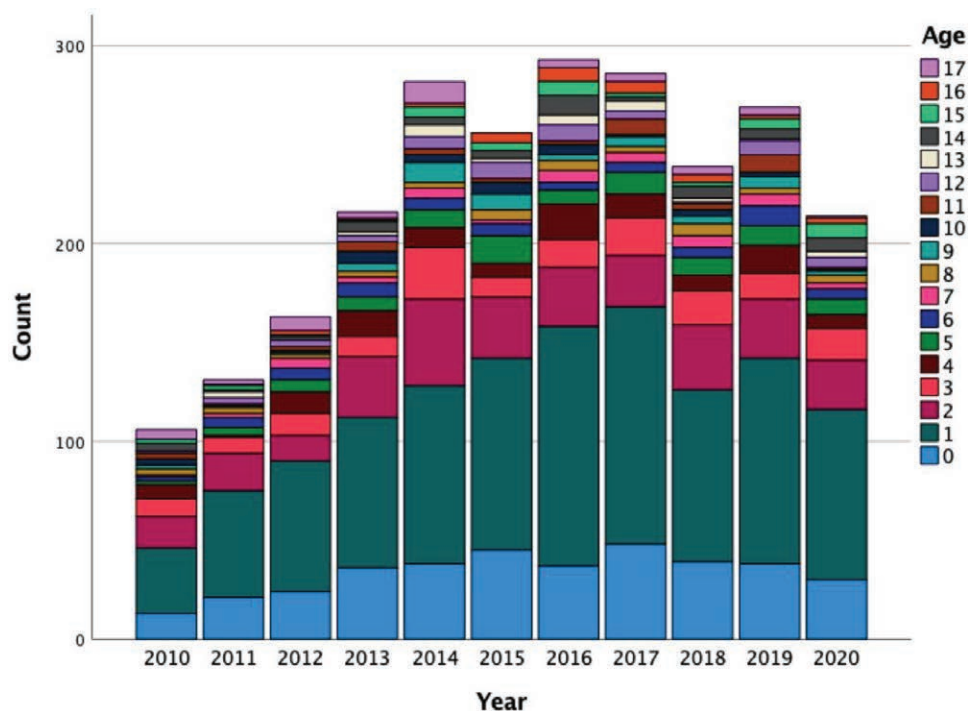
	<5 Years (n = 1862)	5–17 Years (n = 593)	Inpatients (n = 886)	Outpatients (n = 1569)	Total (n = 2455)
Age, y					2455
Mean (SD)	1.3 (0.03)	10.3 (0.16)	3.2 (4.4)	3.6 (4.5)	3.48
Gender, n (%)					2455
Boys	1118 (60)	355 (60)	554 (63)	919 (59)	1473 (60)
TBSA %, n					2021
Mean (SD)	3.97 (0.14)	5.02 (0.45)	8.5 (8.9)	1.4 (2.0)	4.23 (6.8)
Median (IQR)	2.0 (5)	1.5 (5)	6 (8)	0.75 (2)	1.8 (4.5)
Burn mechanism, n (%)					2455
Scald	1169 (63)	263 (44)	685 (77.3)	747 (47.6)	1432 (58.3)
Contact	638 (34)	225 (38)	125 (14.1)	738 (47.0)	863 (35.2)
Flame	22 (1)	52 (9)	41 (4.6)	33 (21.0)	74 (3)
Explosion	1	20 (3)	10 (1.1)	11 (0.7)	21 (0.9)
Electrical	10 (0.5)	9 (1.5)	9 (1.0)	10 (0.6)	19 (0.8)
Chemical	11 (0.6)	8 (1.3)	9 (1.0)	10 (0.6)	19 (0.8)
Frostbite	3 (0.2)	2 (0.3)	0	5 (0.3)	5 (0.2)
Unspecified	8 (0.4)	14 (2.3)	7 (0.8)	15 (1.0)	22 (0.9)
Admittance, n (%) inpatients	697 (37.4)	189 (31.9)			886 (36.1)
Temporary ID numbers, n (%)	126 (6.8)	30 (5.1)	81 (9.1)	75 (4.8)	156 (6.4)

**Table 2. Time Trend of Pediatric Burn Patients Managed at Uppsala and Linköping Burn Centers**

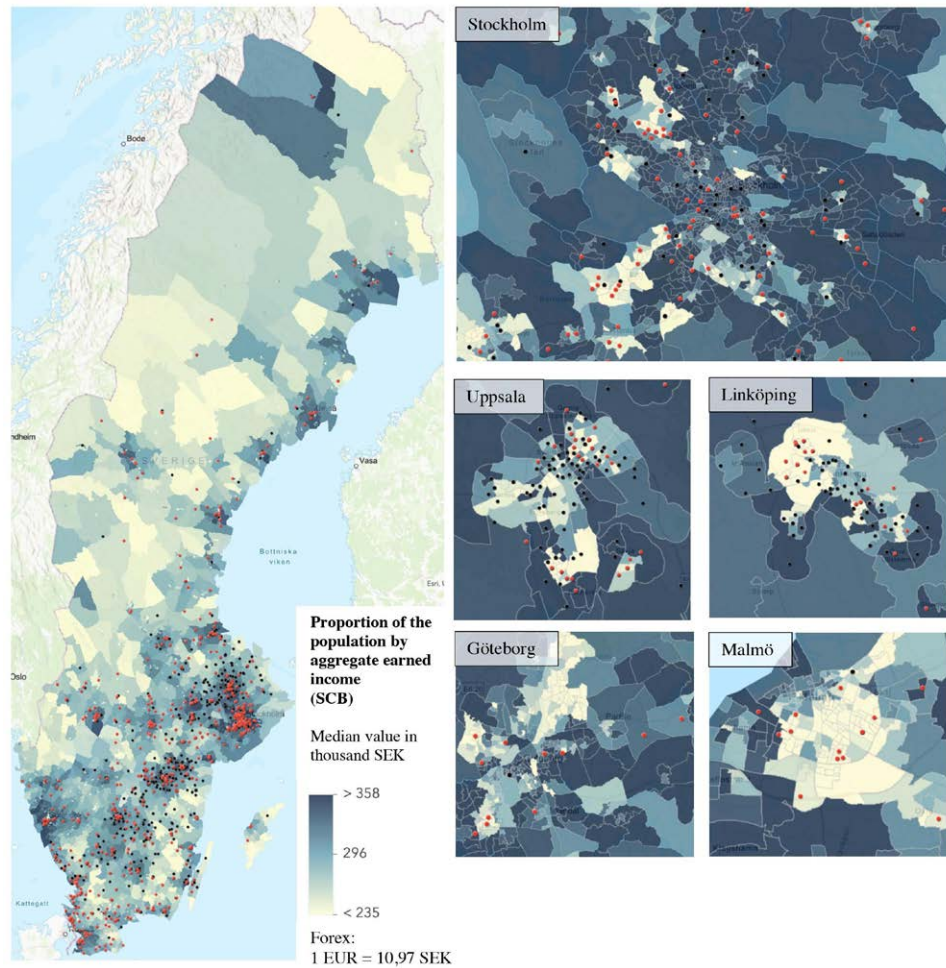
Year	Patients	Asylum Seekers (%)	Total Number of Child Asylum Seekers	Incidence per 100,000 Asylum Seekers	Total No. Children Aged 0–17 in Sweden	Incidence per 100,000 Resident and Citizen Children* Aged 0–17 in Sweden	Relative Risk, Asylum Seekers versus Residents
2010	106	5 (4.7)	10,495	47.6	1,919,094	5.2	9.2
2011	131	3 (2.3)	9699	30.9	1,919,206	6.6	4.7
2012	163	8 (4.9)	14,151	56.5	1,928,121	7.8	7.2
2013	216	3 (1.4)	16,452	18.2	1,952,478	10.9	1.7
2014	282	6 (2.1)	23,110	26.0	1,985,282	13.7	1.9
2015	256	22 (8.6)	70,384	31.3	2,025,077	11.4	2.7
2016	293	35 (11.9)	10,909	320.8	2,076,407	12.2	26.3
2017	286	20 (7.0)	8507	235.1	2,121,598	12.3	19.1
2018	239	7 (2.9)	6329	110.6	2,155,379	10.5	10.5
2019	269	6 (2.2)	6415	93.5	2,180,508	11.9	7.9
2020	214	5 (2.3)	3566	140.2	2,189,403	9.5	14.8
Total	2455	120		101.0†		10.2†	9.6†

\*Patients with Swedish personal numbers.

†Mean value for the years 2010–2020.



**Fig. 1.** Patients by age between 2010 and 2020 at Uppsala and Linköping specialized burn centers. Each patient counted once. Information on outpatients complete from 2013.



**Fig. 2.** Geographical distribution of patients managed at the two specialized burn centers in Sweden.

seekers, the most common countries of origin were Syria ( $n = 29$ , 24%), Afghanistan ( $n = 16$ , 13.2%), and Iraq ( $n = 14$ , 11.6%). Among the tourists, the most common country of origin was Germany ( $n = 8$ , 40%). The countries of citizenship or origin represented by the patients are listed in SDC 2. (See appendix, Supplemental Digital Content 2, which displays country of citizenship for patients with temporary ID. <http://links.lww.com/PRSGO/B992>.)

## DISCUSSION

A majority of the pediatric burn patients were boys ( $n = 1773$ , 60%) and below 5 years of age ( $n = 1862$ , 76%). The number of pediatric patients doubled during the study period, but this was not a statistically significant increment in relation to population size. Patients residing in geographic areas with an income level below the national median ( $n = 1974$ , 83%), and asylum seekers, were over-represented.

Previous studies have documented that boys and men are more prone to sustain burn injuries than girls and women are.<sup>13,27–31</sup> In Sweden, the proportion of male burn patients ranges between 66% and 69%.<sup>15,32,33</sup> Young children and patients older than 70 years tend to show a less pronounced gender difference.<sup>15,27,32</sup> The age distribution

resembles that in previous studies where young children compared with older make up a large proportion of the patients.<sup>10,11,15,29,30</sup> As in previous research, the present study also demonstrates that the most frequent causes of burn injury are scalds in children below 5 years, whereas flame and contact burns are more common in older children.<sup>28,30,34–37</sup> This information is important for the development and implementation of prevention strategies for pediatric burns.

Our health depends largely on the conditions in which we are born, grow, work, live, and age. These non-medical components influence health outcomes and are referred to as the social determinants of health.<sup>38</sup> In the present study, most patients lived in areas with lower-than-median income levels. The risk of injury in children increases when they live under socioeconomically disadvantaged circumstances.<sup>2,3,6,7,35,39</sup> They have a higher risk of burns than of other traumatic injuries.<sup>2,5,9</sup> In Sweden, a 1992 study demonstrated a correlation between increased general mortality risk and socioeconomic status among children from lower social classes.<sup>40</sup> In a report from UNICEF and WHO, family income, maternal education and age, number of children in household, overcrowding, and type of housing were associated with risk of burns in children.<sup>2</sup>

In the present study, asylum seekers were heavily over-represented. Their relative risk of sustaining burn injuries requiring management at a burn center was almost tenfold that of children who were resident or citizens in Sweden. In addition, the children with temporary ID were more frequently hospitalized than those resident in Sweden, indicating that the former also sustain burns that are more severe than those of their Swedish peers. This is similar to findings from 2003 to 2004 when children with asylum-seeking status were over-represented among pediatric burn patients in Ireland.<sup>41</sup> In Ireland, these injuries were associated with poor living standards and unsafe home environments. In Switzerland, migrants coming from countries of low human development index have been identified as running an increased risk of sustaining burns, most likely due to low socioeconomic status, poor education level, and crowded housing.<sup>42</sup> Sweden enjoys high safety standards and regulations for avoiding injuries. Children with asylum status apparently do not fully benefit from these strategies as much as other children in Sweden. This represents a health inequity that should be possible to even out with prevention strategies tailored toward those most in need. Also, in the group studied, a majority of the burns were scalds occurring in children younger than five years. Such injuries mostly occur in the home environment, and therefore preventive strategies should address the housing situation, including safe cooking facilities and risk awareness among the children's caretakers.

This study has several limitations. First, income level per DeSO was used as a proxy indicator for socioeconomic status. Secondly, patient-level data on socioeconomic status were not available. A follow-up study with patient-level data is planned to gain more granular insight into the relative contribution of, for example, income level, educational level, and employment status. Strengths of the study included completeness of data over a fairly long period.

All forms of pediatric healthcare in Sweden are free of charge. Cost of care to the patient and the family is therefore not a barrier to accessing even the highest level of burn care in the country.<sup>18</sup> The threshold for referring pediatric burn cases to the specialized centers is low. Thus, the present patients represent the majority of the children who sustained burns requiring specialized care in an inpatient setting. The findings regarding the hospitalized patients are generalizable to the entire pediatric population in Sweden. Outpatient management of burns is carried out in all seven university hospitals in reconstructive plastic surgery or pediatric surgery, but also at lower-level hospitals and within primary health care, depending on the severity and location of the burn. The present outpatients therefore represent the most severe cases potentially in need of surgical intervention and specialized follow-up, plus those with small or less complicated burns who live in the vicinity of the two burn centers. The outpatient data may be less generalizable than the inpatient data. However, it is not likely that factors associated with the risk of sustaining burns, particularly in children younger than 5 years, will vary much depending on geographical location.

## CONCLUSIONS

Children living in areas with income levels lower than the median and those with asylum-seeking status were over-represented among pediatric burn patients in the two specialized burn centers in Sweden. Prevention strategies tailored toward those most in need must be designed and implemented so that this inequity in health can be eliminated.

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## REFERENCES

- Mathers C, Fat DM, Boerma JT, World Health Organization, eds. *The Global Burden of Disease: 2004 Update*. Geneva, Switzerland: World Health Organization; 2008.
- Peden M, Oyegbite K, Ozanne-Smith J, et al, eds. *World Report on Child Injury Prevention*. Geneva, Switzerland: World Health Organization. Available at <http://www.ncbi.nlm.nih.gov/books/NBK310641/>. Published 2008. Accessed September 10, 2020
- Shimony-Kanat S, Benbenishty J. Age, ethnicity, and socioeconomic factors impacting infant and toddler fall-related trauma. *Pediatr Emerg Care*. 2018;34:696–701.
- Fang X, Jing R, Zeng G, et al. Socioeconomic status and the incidence of child injuries in China. *Soc Sci Med*. 2014;102:33–40.
- Edwards P, Roberts I, Green J, et al. Deaths from injury in children and employment status in family: analysis of trends in class specific death rates. *BMJ*. 2006;333:119.
- Roberts I. Cause specific social class mortality differentials for child injury and poisoning in England and Wales. *J Epidemiol Community Health*. 1997;51:334–335.
- Laing GJ, Logan S. Patterns of unintentional injury in childhood and their relation to socio-economic factors. *Public Health*. 1999;113:291–294.
- Baker R, Tata LJ, Kendrick D, et al. Differing patterns in thermal injury incidence and hospitalisations among 0–4 year old children from England. *Burns*. 2016;42:1609–1616.
- Hippisley-Cox J, Groom L, Kendrick D, et al. Cross sectional survey of socioeconomic variations in severity and mechanism of childhood injuries in Trent 1992–7. *BMJ*. 2002;324:1132.
- Goltsman D, Li Z, Bruce E, et al. Spatial analysis of pediatric burns shows geographical clustering of burns and 'hotspots' of risk factors in New South Wales, Australia. *Burns*. 2016;42:754–762.
- Heng JS, Atkins J, Clancy O, et al. Geographical analysis of socioeconomic factors in risk of domestic burn injury in London 2007–2013. *Burns*. 2015;41:437–445.
- Delgado J, Ramírez-Cardich ME, Gilman RH, et al. Risk factors for burns in children: crowding, poverty, and poor maternal education. *Inj Prev*. 2002;8:38–41.
- Smolle C, Cambiaso-Daniel J, Forbes AA, et al. Recent trends in burn epidemiology worldwide: a systematic review. *Burns*. 2017;43:249–257.
- Tevlin R, Dillon L, Clover AJP. Education in burns: lessons from the past and objectives for the future. *Burns*. 2017;43:1141–1148.
- Svee A, Jonsson A, Sjöberg F, et al. Burns in Sweden: temporal trends from 1987 to 2010. *Ann Burns Fire Disasters*. 2016;29:85–89.
- Mock C, Peck M, Peden M, et al. A WHO plan for burn prevention and care. Available at [http://www.who.int/violence\\_injury\\_prevention](http://www.who.int/violence_injury_prevention). Published online 2008. Accessed October 7, 2020.
- Anell A, Glenngård AH, Merkur S. Sweden health system review. *Health Syst Transit*. 2012;14:1–159.

18. Patientavgifter i hälso-och sjukvården 2020. Published 2020. Available at <https://skr.se/halsasjukvard/patientinflytande/patientavgifter.14668.html>.
19. Sveriges befolkning, SCB. Published 2021. Available at <https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/sveriges-befolkning/>. Accessed October 28, 2021.
20. European Practice Guidelines for Burn Care. Available at <https://www.euroburn.org/wp-content/uploads/EBA-Guidelines-Version-4-2017.pdf>. Published online 2017. Accessed July 28, 2021.
21. Inkomster för personer i Sverige. Sverige i siffror. SCB. Available at <https://www.scb.se/hitta-statistik/sverige-i-siffror/utbildning-jobb-och-pengar/inkomster-for-personer/>. Accessed December 13, 2020.
22. Öppna geodata för DeSO – Demografiska statistikområden. Våra tjänster SCB. Published 2020. Available at <https://scb.se/vara-tjanster/oppna-data/oppna-geodata/deso-demografiska-statistikomraden/>. Accessed December 13, 2020.
23. Statistik, Asylsökande i Sverige. Migrationsverket. Published 2020. Available at <https://www.migrationsverket.se/Om-Migrationsverket/Statistik/Asyl.html>. Accessed December 29, 2020.
24. DeSO - Demografiska statistikområden. Published 2001. Hitta statistik. SCB. Available at <https://scb.se/hitta-statistik/regional-statistik-och-kartor/regionala-indelningar/deso-demografiska-statistikomraden/>. Accessed December 13, 2020.
25. Folkmängden efter region, civilstånd, ålder och kön. År 1968–2019. Statistikdatabasen SCB. Published 2020. Available at [http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START\\_BE\\_BE0101\\_BE0101A/BefolkningNy/](http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START_BE_BE0101_BE0101A/BefolkningNy/). Accessed December 18, 2020.
26. ArcGIS SCB data. Published 2020. Available at [https://www.arcgis.com/home/webmap/viewer.html?url=https://services9.arcgis.com/BH6j7VrWdIXhhNYw/ArcGIS/rest/services/Befolkning\\_efter\\_sammanraknad\\_förvärvsinkomst/FeatureServer&source=sd](https://www.arcgis.com/home/webmap/viewer.html?url=https://services9.arcgis.com/BH6j7VrWdIXhhNYw/ArcGIS/rest/services/Befolkning_efter_sammanraknad_förvärvsinkomst/FeatureServer&source=sd). Accessed October 31, 2021.
27. Brusselsaers N, Monstrey S, Vogelaers D, et al. Severe burn injury in Europe: a systematic review of the incidence, etiology, morbidity, and mortality. *Crit Care*. 2010;14:R188.
28. Kemp AM, Jones S, Lawson Z, et al. Patterns of burns and scalds in children. *Arch Dis Child*. 2014;99:316–321.
29. Poulos RG, Hayen A, Chong SS, et al. Geographic mapping as a tool for identifying communities at high risk of fire and burn injuries in children. *Burns*. 2009;35:417–424.
30. Rawlins JM, Khan AA, Shenton AF, et al. Epidemiology and outcome analysis of 208 children with burns attending an emergency department. *Pediatr Emerg Care*. 2007;23:289–293.
31. Kraft R, Herndon DN, Al-Mousawi AM, et al. Burn size and survival probability in paediatric patients in modern burn care: a prospective observational cohort study. *Lancet*. 2012;379:1013–1021.
32. Akerlund E, Huss FR, Sjöberg F. Burns in Sweden: an analysis of 24,538 cases during the period 1987–2004. *Burns*. 2007;33:31–36.
33. Zötterman J, Steinvall I, Elmasry M. Better protection of glass-fronted stoves is needed in Sweden because of the increase in the number of contact burns among small children. *J Burn Care Res*. 2018;39:618–622.
34. Johnson EL, Maguire S, Hollén LI, et al. Agents, mechanisms and clinical features of non-scald burns in children: A prospective UK study. *Burns*. 2017;43:1218–1226.
35. Lee CJ, Mahendraraj K, Houng A, et al. Pediatric burns: a single institution retrospective review of incidence, etiology, and outcomes in 2273 burn patients (1995–2013). *J Burn Care Res*. 2016;37:e579–e585.
36. Strobel AM, Fey R. Emergency care of pediatric burns. *Emerg Med Clin North Am*. 2018;36:441–458.
37. Hettiaratchy S, Dziewulski P. ABC of burns: pathophysiology and types of burns. *BMJ*. 2004;328:1427–1429.
38. World Health Organization. WHO Social determinants of health. Published 2008. Available at [https://www.who.int/health-topics/social-determinants-of-health#tab=tab\\_1](https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1). Accessed October 31, 2021.
39. Laflamme L, Burrows S, Hasselberg M. Socioeconomic differences in injury risks. Published online January 2009. Available at [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0012/111036/E91823.pdf](https://www.euro.who.int/__data/assets/pdf_file/0012/111036/E91823.pdf). Accessed November 25, 2020.
40. Ostberg V. Social class differences in child mortality, Sweden 1981–1986. *J Epidemiol Community Health*. 1992;46:480–484.
41. Dempsey MP, Orr DJ. Are paediatric burns more common in asylum seekers? An analysis of paediatric burn admissions. *Burns*. 2006;32:242–245.
42. Elrod J, Schiestl CM, Mohr C, et al. Incidence, severity and pattern of burns in children and adolescents: an epidemiological study among immigrant and Swiss patients in Switzerland. *Burns*. 2019;45:1231–1241.