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Review

Recent trends in burn epidemiology worldwide: A systematic review

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ABSTRACT

Burns have been more prevalent among low socioeconomic populations and in less developed regions. Incredible advances in burn care and social development over the recent decades, however, should have placed the incidence and severity of burns in a downwards trend. The aim of this review was to give an overview on current trends in burn epidemiology across the world. Also the socioeconomic development in countries that have published epidemiological data used in this study has been taken into account when comparing the results. There was a worldwide downwards trend of burn incidence, burn severity, length of hospital stay, and mortality rate. These findings were particularly pronounced in very highly developed countries. Data from highly and medium developed countries were more heterogeneous. No studies could be obtained from low and middle income countries. Comparisons between the different studies were compromised by the fact that studies emerged from specialized facilities on one hand and general hospitals on the other. Analyzed studies were also frequently focusing on limited patient populations such as “children” or “elderly”. Our findings indicate the need for an international burn database with a minimal data-set in order to obtain objective and comparable results in respect of burn epidemiology.

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1. Introduction

Burns are devastating injuries, often resulting in significant morbidity, impairment of emotional well-being, and

experienced quality of life. In addition to the stressful immediate care, burns often benefit from long-term treatment with numerous outpatient visits (dressing changes etc.) and multiple reconstructive surgical procedures±concomitant hospital stays. These health-related consequences of burns are often accompanied with additional socioeconomic burdens for burn victims and their families [1–5].

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Socioeconomic development in different countries is a continuous process affecting basically every aspect of life. Its impact on human health is evident. According to the Human Development Reports 2015, the average mortality rate between high and low/middle income countries differ by a factor 3 (57:106 and 249:291 (women:men) per 1000 respectively), while the access to physicians per 10,000 inhabitants differ with about a factor 10 (27.9 and 2.9 physicians per 10,000 inhabitants, respectively) [6]. It is not surprising that burns are also more common in populations with lower socioeconomic

status and delayed developmental growth [3,7–9], e.g., a lack of basic safety education has been associated with increased risk for burns [10]. Furthermore, the majority of burns are preventable. Measures such as educational programs, introduction of smoke alarms/detectors, and controlled hot water in households have contributed significantly to decrease burn incidence rates and severity when applied [3,10,11].

In pace with the increasing worldwide socioeconomic development there should be a decreasing trend of burns. The aim of this literature review was to assess recent

Table 1 – Studies and results.

Study	Country	HDI	Period	Age (years)	Incidence	Severity	LOS	Mortality	M:F
Duke et al. [25] ^a	Australia	VHI	1983–2008	All	Decline*	–	Decline	Decline	2.1:1
Duke et al. [26] ^a	Australia	VHI	1983–2008	0–5	Decline	–	–	–	1.5:1
Duke et al. [24] ^a	Australia	VHI	1983–2008	15–29	Decline	Decline (size)	–	–	3.1:1
Duke et al. [23] ^a	Australia	VHI	1983–2008	≥60	Decline	–	Decline	Decline	1.8:1
Greenwood et al. [13]	Australia	VHI	1996–2004	Adult	Increase	Decline (size)	–	–	1.8:1
Pegg [14]	Australia	VHI	1982–2002	All	Increase	–	–	Decline	3.8:1
Trop et al. [27]	Austria	VHI	1988–2012	≤18	Decline	Decline (depth)	Decline	Decline	1.8:1
Zayakova et al. [15] ^a	Bulgaria	HI	2002–2011	All	Increase*	Decline* (size+depth)	Decline*	Increase	1.4:1
Burton et al. [48] ^a	Canada	VHI	1995–2004	Adult	No trend	–	No trend	–	2.4:1
Spinks et al. [28] ^a	Canada	VHI	1994–2003	≤19	Decline*	–	No trend	Decline*	2.0:1
Gomez et al. [29]	Canada	VHI	1996–2005	>15	Decline	No trend (size)	–	Decline*	2.5:1
Goldsack et al. [30]	Chile	VHI	2001–2011	<15	Decline	Decline (depth)	–	–	1.1:1
Yongqiang et al. [49]	China	HI	2001–2005	All	No trend	–	–	–	3.0:1
Zhu et al. [16] ^a	China	HI	2001–2010	≤14	Increase*	Decline* (size)	No trend	Decline*	1.5:1
Cheng et al. [31]	China	HI	2000–2008	All	Decline*	No trend (size)	No trend	No trend	2.4:1
Hai Jun et al. [32] ^a	China	HI	1970–2008	<14	Decline	Decline (size+depth)	Decline*	Decline	1.7:1
Celko et al. [17] ^a	Czech Rep.	VHI	1996–2006	<15	Increase	–	–	–	1.8:1
Ortiz-Prado et al. [50]	Ecuador	HI	2005–2014	≥16	No trend	–	–	–	2.3:1
Laitakari et al. [8] ^a	Finland	VHI	1990–2011	<1	Increase	–	–	No trend	1.5:1
Theodorou et al. [33]	Germany	VHI	1991–2010	All	Decline	Decline* (size)	Decline (ICU ^b)	Decline	2.3:1
Ying and Ho [34], Tse et al. [35]	Hong Kong	VHI	1993–2005	≤15	Decline	–	–	–	1.4:1
Sarma [11] ^a	India	MI	1994–2007	All	Decline*	–	–	–	1.1:1
Karimi et al. [18]	Iran	HI	2005–2009	<15	Increase	–	–	–	1.7:1
Harats et al. [19] ^a	Israel	VHI	1997–2010	All	Increase	Decline* (size+depth)	Decline	Decline	2.1:1
Haik et al. [9] ^a	Israel	VHI	1997–2003	All	–	Decline* (size+depth)	No trend	Decline*	2.1:1
Akita et al. [36]	Japan	VHI	1983–2002	<6	Decline	–	–	–	1.3:1
Orozco-Valerio et al. [37] ^a	Mexico	HI	1979–2009	All	Decline*	–	–	Decline*	–
Dokter et al. [38] ^a	Netherlands	VHI	1995–2011	All	Decline*	Decline (size)	Decline*	Decline*	1.9:1
Vloemans et al. [20] ^a	Netherlands	VHI	1995–2007	≤17	Increase	Decline* (size+depth)	Decline	No trend	–
Al-Shaqsi et al. [21] ^a	Oman	HI	1987–2011	All	Increase	–	Decline	Decline	1.5:1
Song and Chua [39]	Singapore	VHI	1997–2003	All	Decline	–	No Trend	No Trend	2.2:1
Wesson et al. [40]	South Africa	MI	1995–2009	<13	Decline	–	–	–	1.4:1
Maritz et al. [41]	South Africa	MI	2003–2008	All	Decline	–	–	No Trend	1.8:1
Herbert et al. [42]	South Africa	MI	1997–2006	<13	Decline	–	–	–	–
Seo et al. [43] ^b	South Korea	VHI	2003–2012	All	Decline	–	–	Decline	2.9:1
Åkerlund et al. [44] ^a , Jonsson et al. [47] ^a	Sweden	VHI	1987–2004	All	Decline*	–	Decline*	Decline*	2.2:1
Tung et al. [51] ^a	Taiwan	HI	1997–2003	All	No trend	Decline* (size)	–	–	1.5:1
Stylianou et al. [22] ^a	UK	VHI	2003–2011	All	Increase	–	Decline	Decline	1.7:1
Hussain and Dunn [54] ^a	UK	VHI	2000–2010	All	–	–	–	Decline*	–
Fagenholz et al. [45] ^a	US	VHI	1993–2004	All	Decline*	–	–	–	1.4:1
Saeman et al. [46]	US	VHI	1974–2010	≤18	Decline	Decline* (size)	Decline*	Decline*	2.0:1
Macrino et al. [52]	US	VHI	1981–2006	≥65	–	Decline* (size)	Decline*	Decline*	1.2:1
Lentz et al. [53] ^a	US	VHI	2005–2014	All	–	–	Decline	–	2.1:1
Pham et al. [55] ^a	US	VHI							

^a Multicenter study.

^b Results from intensive care units only.

* Statistically significant ($p < 0.05$).

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