

The Association of Plastic Surgery Facility Volume with Improved Inpatient Burn Outcomes

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The authors declare no conflicts of interest.

BACKGROUND

MATERIALS & METHODS

RESULTS

- Acute burn care involves a spectrum of physicians, nurses, and allied health professionals. Similarly, burn surgeons have variable training backgrounds that originate from different specialties.
- Plastic surgery was founded on the core principles of reconstruction and offers the full spectrum of acute burn care and reconstructive surgery. Previous work has shown that variations in practice within burn surgery are partially driven by training background.
- Even when plastic surgeons are not directly involved in the burn unit, access to plastic surgery within the same facility has the potential to improve reconstructive outcomes.

Data & Variables

- Acute burn patients with known percent total body surface area (%TBSA) were extracted from the National Inpatient Sample (NIS) from 2012-2014 based on International Classification of Disease 9th Edition codes.
- Plastic surgery volume per facility for the entire NIS was determined based on established ICD-9 codes for flap procedures, breast reconstruction, and complex hand reconstruction (PMID 24108144, *Ann Plast Surg.* 2015;74(5):597–602.)

Analysis & Modeling

- Outcomes included odds of receiving a flap procedure (ICD-9 PR codes 8670, 8671, 8673, 8674), patient safety indicators (venous thromboembolic event, sepsis, surgical bleeding, pneumonia, wound complications) and mortality.
- All outcomes were binary, and therefore, modeled with logistic regression.
- Models were adjusted for the following variables: age, %TBSA, gender, inhalation injury, comorbidities (Elixhauser comorbidity index), hospital size, and urban/teaching status.

This study aims to:

- Characterize plastic surgery volume by facility
- Determine the association of plastic surgery volume with inpatient burn outcomes including likelihood of receiving flap, patient safety indicators (i.e. complications), and mortality.

- We hypothesize that plastic surgery facility volume would be associated with improved inpatient outcomes in the treatment of burn injuries.

Plastic Surgery Facility Volume is Associated with

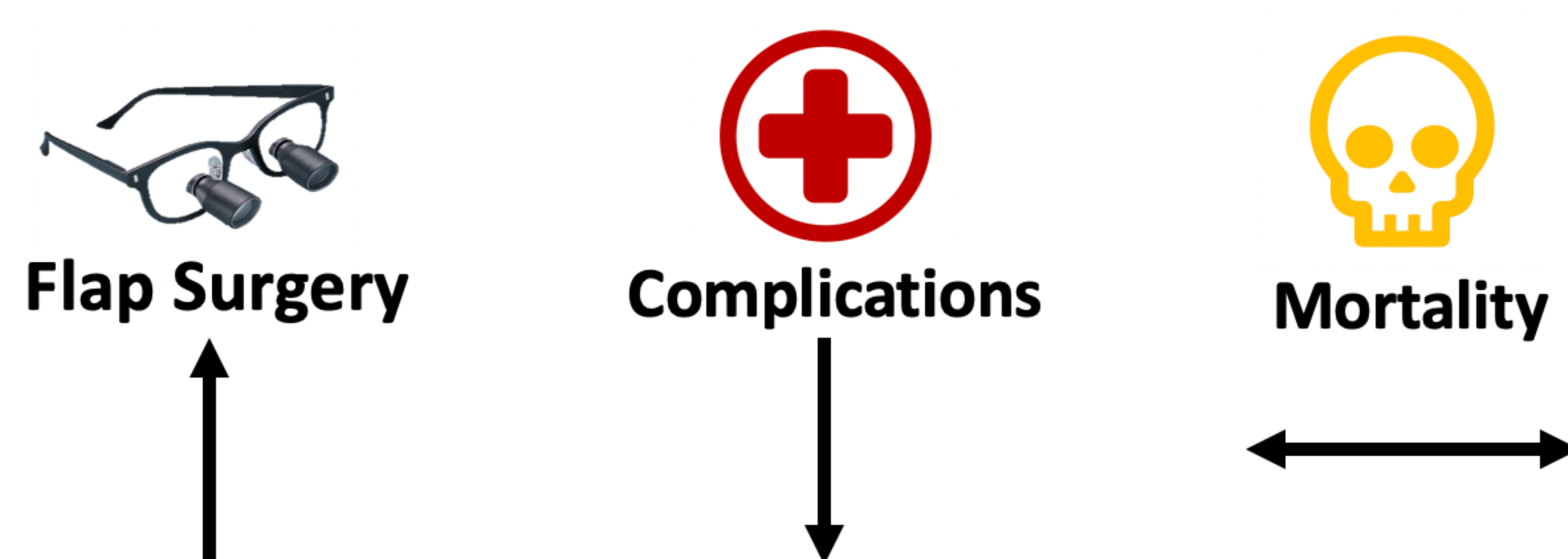
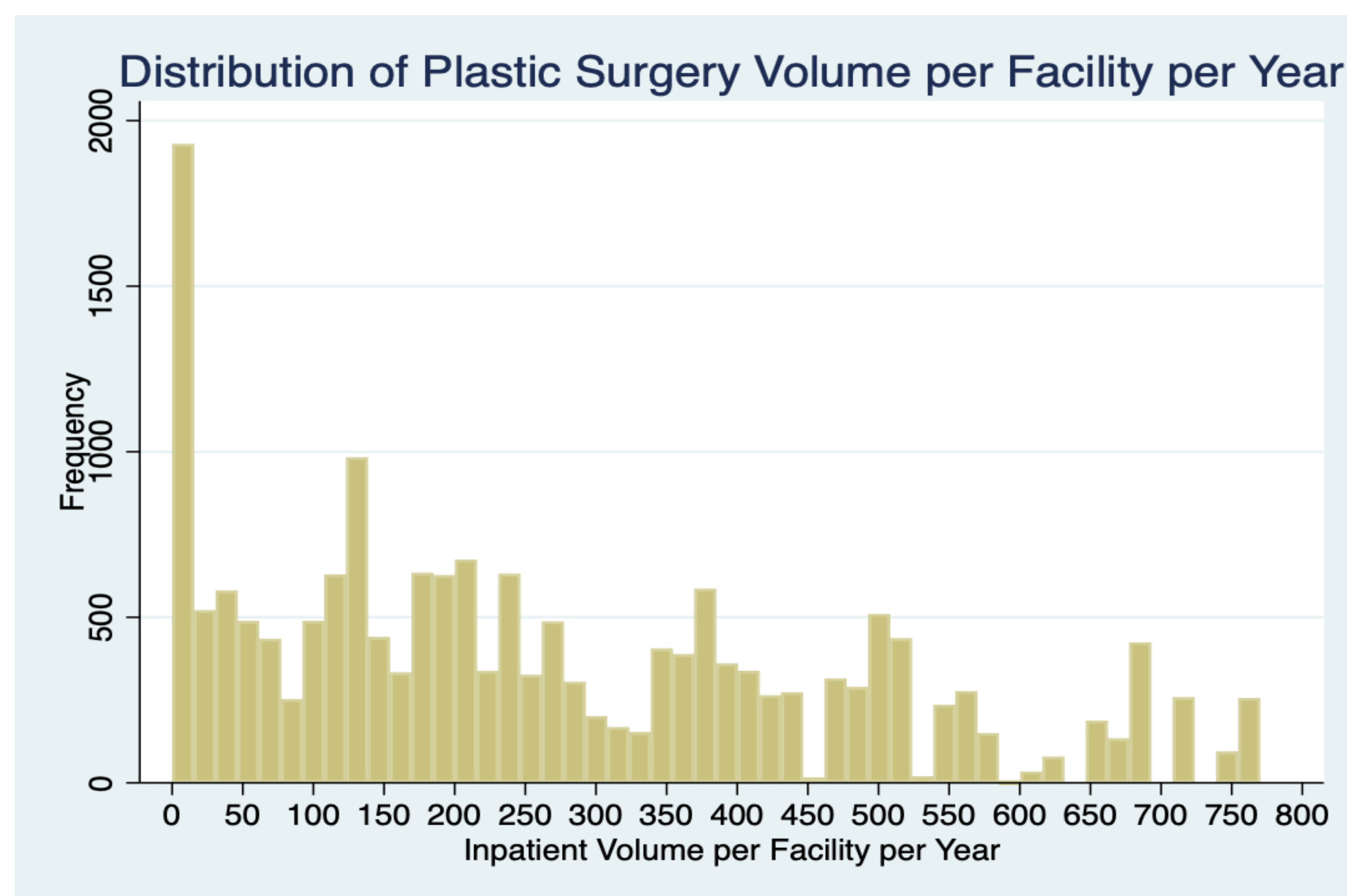


Table 1: Logistic Regression Evaluating Probability of Undergoing Flap Procedure

Variable	Odds Ratio (95% CI low-high)	p-value
%TBSA	1.0 (0.90-1.2)	0.697
Age	1.0 (1.0-1.0)	0.009
Female	0.94 (0.66-1.3)	0.745
Elixhauser Comorbidity Index	1.1 (0.99-1.2)	0.074
Inhalation Injury	0.49 (0.18-1.3)	0.169
Plastic surgery hospital volume		
1 st quartile	Ref	
2 nd quartile	2.2 (1.3-3.7)	0.006
3 rd quartile	2.3 (1.3-4.1)	0.004
4 th quartile	1.9 (1.1-3.5)	0.028
Bed-size		
Small	Ref	
Medium	0.52 (0.24-1.1)	0.101
Large	0.63 (0.31-1.3)	0.208
Hospital setting		
Urban Teaching	Ref	
Rural	1.7 (0.59-5.2)	0.315
Urban non-teaching	1.3 (0.79-2.1)	0.364

Table 2: Logistic Regression Evaluating Probability of Patient Safety Indicator During Admission

Variable	Odds Ratio (95% CI low-high)	p-value
%TBSA	1.6 (1.5-1.6)	<0.001
Age	1.0 (1.0-1.0)	<0.001
Female	0.81 (.72-.91)	0.001
Elixhauser Comorbidity Index	1.5 (1.4-1.5)	<0.001
Inhalation Injury	2.5 (2.1-3.0)	<0.001
Plastic surgery hospital volume		
1 st quartile	Ref	
2 nd quartile	0.81 (0.71-.99)	0.041
3 rd quartile	0.84 (0.71-1.0)	0.051
4 th quartile	0.71 (0.59-.85)	<0.001
Bed-size		
Small	Ref	
Medium	1.1 (0.86-1.4)	0.417
Large	1.1 (0.89-1.4)	0.321
Hospital setting		
Urban Teaching	Ref	
Rural	1.2 (0.88-1.7)	0.219
Urban non-teaching	0.87 (0.73-1.0)	0.126



CONCLUSION & APPLICABILITY TO PRACTICE

- Burn patients treated at high volume plastic surgery facilities were more likely to undergo flap procedures during their admission compared to low volume centers. High volume plastic surgery facilities were associated with lower likelihood of inpatient complications, although there were no differences in mortality.
- These data encourage the treatment of burn patients at high volume plastic surgery facilities.