

A Comparative Analysis of Factors Affecting Orthopedic Accessibility in Four Different Countries

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INTRODUCTION

- Of the 2582 cases presenting to the orthopedic emergency ward in Poursina Hospital (a referral center in northern Iran), 66.5% had fractures, most commonly resulting from falls¹
- Considering that identifying risk factors and modifying existent prevention systems are the basis of any healthcare system;
 - Why is orthopedic care in rural systems failing?
 - Why are patients traveling to urban areas to get orthopedic care?
 - What is this effect of this preventable acute orthopedic traumatic event on the patient's quality of life and lifespan?
- Issues to consider:
 - An accessibility issue to orthopedic clinics
 - Rural healthcare systems fail to provide sufficient orthopedic care
 - Rural locations have high needs for orthopedic care due to factors such as occupational trauma and accidental injury due to architectural integrity
- Combining the high need for orthopedic care with low access to such a specialty results in a poor prognosis for basic orthopedic injuries in rural areas internationally^{1,2,4}



Source: <https://mw2.google.com/mw-panoramio/photos/medium/9787259.jpg>

METHODS

- A retrospective analysis of previous studies regarding international orthopedic medicine internationally was completed.
- A textword search was conducted on the online PubMed database using key terms including: *rural care*, *orthopedic accessibility*, *international medicine*, and *factors affecting orthopedic care*.
- Articles were further filtered based on specialty, location, a variety of factors discussed and strong correlative strength.
- Articles from 4 different countries were selected on the basis of providing the most evidence and representing the greatest variety of issues relating to orthopedic care accessibility.
- After exploring the previously conducted studies, potential solutions were conceptualized based on the issues reviewed.

RESULTS

Country study was conducted in and what the study analyzed:	Major findings of study:
Iran <ul style="list-style-type: none"> Analyzed the different cases of acute orthopedic care presenting to an orthopedic emergency ward 	<ul style="list-style-type: none"> Of the number of patients presenting to the orthopedic emergency ward, 77% were from rural areas, while 23% were from urban areas¹ The highest frequency of injuries was related to falls¹ The highest frequency of orthopedic trauma found in the 25-44 year old age group¹
Germany <ul style="list-style-type: none"> Analyzed orthopedic accessibility in various regions around Germany 	<ul style="list-style-type: none"> A positive correlation found with the degree of urbanization of $r=0.32$ ($p<0.001$)² The average accessibility index in central urban areas was found to be 0.0052, while outside major urban areas, was found to be 0.0020² Area deprivation analysis revealed a negative correlation of $r=-0.47$ ($p<0.001$)²
Canada <ul style="list-style-type: none"> Analyzed how access to a primary care physician (PCP) affects availability to an orthopedic surgeon 	<ul style="list-style-type: none"> A positive correlation found with office visits to orthopedic surgeons in areas in the lowest and middle tertiles of orthopedic surgeon availability³ A negative association found with the index of geographic availability of orthopedic surgeons³
USA <ul style="list-style-type: none"> Analyzed differences in hospitalization rates between rural injuries and urban injuries 	<ul style="list-style-type: none"> Injury-hospitalization rates generally increased with increasing ruralness⁴ Rates were 27% higher in large rural counties and 35% higher in small rural counties⁴ The hospitalization rates for assaults were highest in large urban counties⁴ The hospitalization rates for unintentional injuries from motor vehicle traffic, falls and poisonings were higher in rural counties⁴

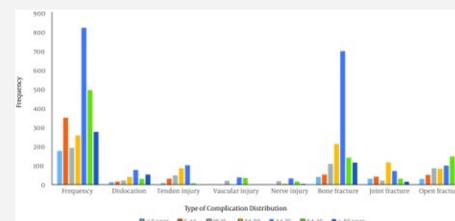


Figure 1. Soleymanha M et al. (2014) Survey of 2582 Cases of Acute Orthopedic Trauma. *Trauma Mon.* 2014. doi:10.5812/traumamon.16215

Table 1. Orthopedic spatial accessibility in major urban areas in Germany. Subdivisions of major urban areas (e.g. 'narrow urban') as defined by the Federal Office for Building and Regional Planning in Germany [23]. SD: standard deviation.

Germany	Major Urban Area				Outside Major Urban Areas
	Center	Central Buffer	Narrow Urban	Wide Urban	
Population (n)	81,368,029	23,601,177	12,798,972	13,120,651	11,520,753
Area (km ²)	306,566	11,424	13,078	53,914	79,301
Accessibility Index					
Mean	0.0027	0.0052	0.0045	0.0034	0.0027
SD	0.0019	0.0056	0.0023	0.0019	0.0014

Table 1. Bauer J et al. Orthopedic workforce planning in Germany - an analysis of orthopedic accessibility. *PLoS One.* 2017. doi:10.1371/journal.pone.0171747

DISCUSSION

- In the 4 countries studied, the findings suggest that orthopedic medicine is needed for the underserved populations and populations in rural areas worldwide. The increased need for orthopedic care is the result of their high risk for acute traumatic injuries.

POSSIBLE SOLUTIONS

- To make orthopedic medicine available to the masses and to be a part of international care, an exploration of rural areas must be conducted to observe any existent prevention systems.
- Two solutions can be presented:
 - Survey our rural areas to educate the populations on risk factors and prevention
 - Reduce the oversupply of care by shifting resources and orthopedic physicians from affluent urban areas to deprived rural areas
 - Pursuing accessibility measures such as a reallocation of resources to our rural areas will have the potential to reduce costs, improving health care.

LIMITATIONS

- Four articles, one from each of the four countries, met the standards we required (a priori) for analysis

REFERENCES

- Soleymanha M et al. (2014) Survey of 2582 Cases of Acute Orthopedic Trauma. *Trauma Mon.* 2014. doi:10.5812/traumamon.16215
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