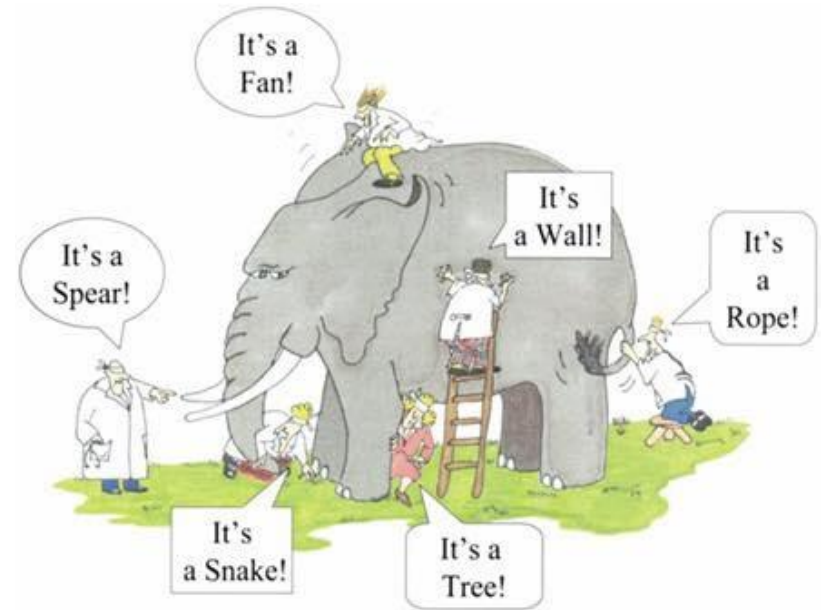


# Methodological issues in estimating the burden of disease due to patient safety incident

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## 맹인모상(盲人摸象)



# INTRODUCTION

## Importance of patient safety issues

- Patient safety is one of the dimensions for quality of healthcare.
- Why patient safety has become an issue?
  - 'To Err is Human: Building a Safer Health System' was published in 1999 based on the results of the Harvard Medical Practice Study, a study that investigated the status of adverse events.



### To Err is Human

#### Building a Safer Health System

Institute of Medicine (US) Committee on Quality of Health Care in America; Editors: Linda T. Kohn, Janet M. Corrigan, and Molla S. Donaldson.

Washington (DC): [National Academies Press \(US\)](#); 2000.  
ISBN-10: 0-309-06837-1

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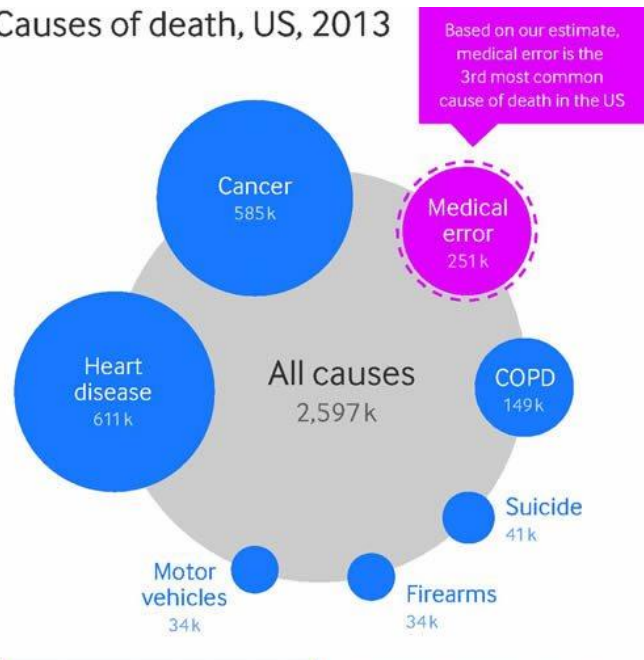
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# INTRODUCTION

## Importance of patient safety issues

- Scale of patient safety problem
  - According to a systematic review article<sup>1)</sup>, the probability of adverse events occurring was 9.2% per hospitalization, the probability of death for patients experiencing adverse events was 7.4%, and the probability of preventability was 43.5%.
  - Are medical errors the 3rd leading cause of death?<sup>2)</sup>

Causes of death, US, 2013



However, we're not even counting this - medical error is not recorded on US death certificates

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Data source:  
[http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64\\_02.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf)

# INTRODUCTION

## Problems for measuring the level of patient safety

- The introduction of various policies to improve the level of patient safety was recommended, and the investment of resources to promote related research was also expanded.
- However, despite the importance of patient safety, measuring the level of patient safety comprehensively and accurately is still a challenge.
- In particular, it is important to develop and calculate patient safety measures that can be compared to other areas or fields in order to prioritize how much resources should be invested in the field of patient safety compared to other disease problems.

# INTRODUCTION

## Purpose of this study

- Despite the importance and urgency of patient safety issues, there is no established standard method for measuring disability adjusted life years (DALY) resulting from patient safety incident (PSI).
- In this study, we reviewed several studies that estimated DALYs due to PSI and presented methodological issues to keep in mind when conducting related research.



# Methods

## Literature review and summary

- We reviewed existing articles on the estimation of DALYs due to PSI.
  - Since there were not many related studies, we searched manually.
- The relevant articles were reviewed according to the issues that must be considered in the process of calculating DALY.
  - What to measure
  - Choice of approach: incidence or prevalence based approach, duration of morbidity.
  - Validity of disability weights
  - Main data sources: incidence or prevalence, mortality rate
  - Other: preventability

# Results

## Literature review results: lack of relevant studies

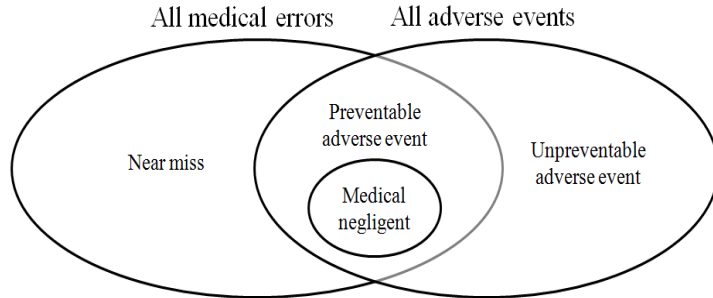
- There are not many studies that measure DALYs to address patient safety issues.
  - Only 3 articles can be found as a result of the search
  - In addition, there is still no agreed upon calculation methodology.

Authors	Title	Year	Journal
Khan MA, et al.	Global Trends and Forecast of the Burden of Adverse Effects of Medical Treatment: Epidemiological Analysis Based on the Global Burden of Disease Study	2020	Cureus
McDonald SA, et al.	Methodology for computing the burden of disease of adverse events following immunization	2018	Pharmacoepidemiol Drug Saf
Choi EY, et al.	Comprehensive measurement of the burden of disease due to adverse events: a new analysis of the cross-sectional patient safety incident inquiry	2023	J Korean Med Sci

# Results

## What do we measure in DALYs?

- Medical error? Adverse event? Patient safety incident?
- Will the degree of harm be taken into account?



Authors	Measurement target
Khan MA, et al.	Adverse effects of medical treatment
McDonald SA, et al.	Adverse events following immunization 1) Idiopathic thrombocytopenia purpura 2) Anaphylaxis 3) Febrile convulsions/seizures
Choi EY, et al.	Adverse events that cause harm beyond permanent disability 1) diagnosis-related 2) drugs/fluids/blood-related 3) patient care-related 4) surgery/procedural-related 5) infection-related 6) other events



# Results

## Specific methodology of measurement

- Which approach makes sense? Is the disability weight appropriate?

Authors	Approach	Disability weight	Duration
Khan MA, et al.	Prevalence based approach	Unclear	N/A
McDonald SA, et al.	Incidence based approach	1) Idiopathic thrombocytopenia purpura: 0.159 (Thrombocytopenia purpura) 2) Anaphylaxis: 0.552 (Epilepsy: severe) 3) Febrile convulsions/seizures: 0.263 (Epilepsy: less severe)	1) Idiopathic thrombocytopenia purpura: 2-8 weeks (max. 6 months) 2) Anaphylaxis: 1 day 3) Febrile convulsions/seizures: 1 day
Choi EY, et al.	Incidence based approach	0.362 (95% confidence interval: 0.306-0.420)	Permanent

# Results

## Are the data sources accurate?

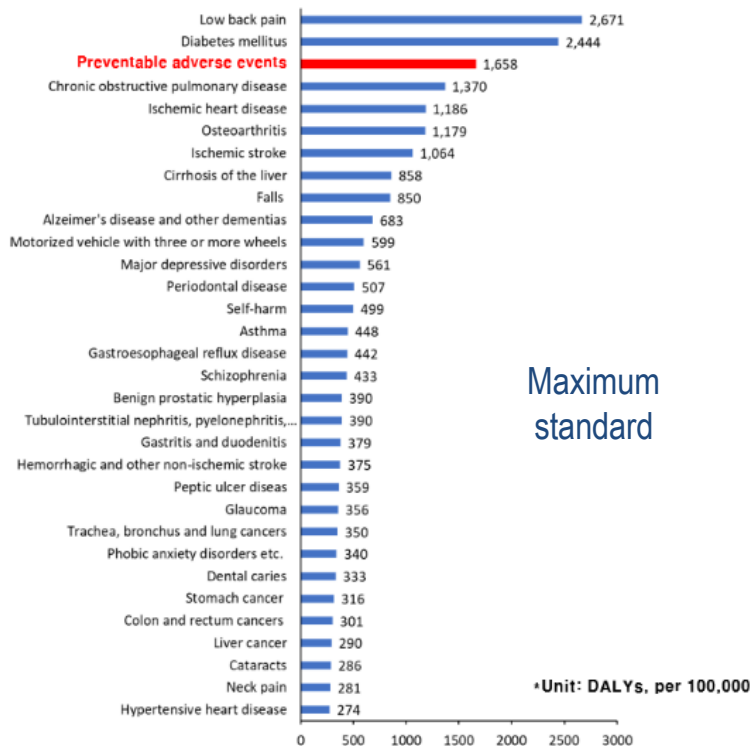
- Measuring the level of patient safety is a very difficult task.
- However, data collected through retrospective medical record review are considered as a gold standard.

Authors	Data source
Khan MA, et al.	The Global Burden of Diseases, Injuries and Risk Factors Study 2017 (GBD 2017): Administrative data using ICD codes (ICD-9 & ICD-10 codes)
McDonald SA, et al.	Previous studies regarding adverse events following immunization: ex) Yong et al, 2010; Sammon et al, 2015
Choi EY, et al.	Patient Safety Incidents Inquiry undertaken in 2019 in Korea

# Results

## Can preventability be considered?

- Only one article considered preventability  
Unlike other diseases, preventable DALYs can be calculated.
- Defining preventability: Is the harm preventable based on current medical standards?
- In the patient safety accident survey, the preventability of hazardous events is measured on a 6-point scale, and a score of 4 or higher is considered preventable.



# Discussion and Conclusion

## Main significance of the study

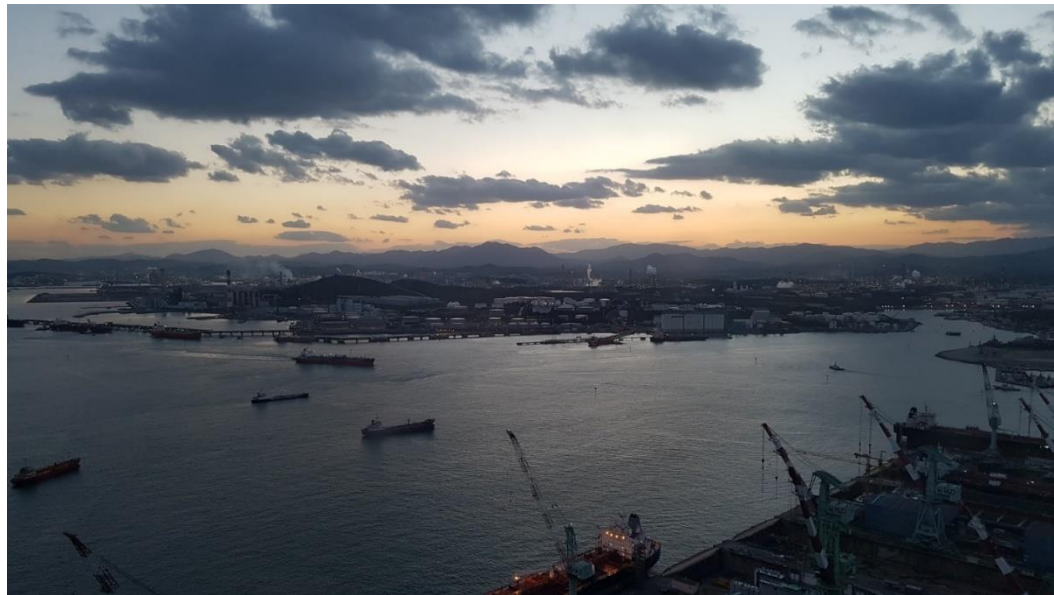
- Despite its importance, studies estimating DALYs due to PSI are lacking.
- Research on calculating the burden of disease related to patient safety will further increase the implications of the burden of disease research.
- There is a need to reach consensus on a standard methodology for estimating DALYs from PSIs.
  - DALY measurement target, approach selection, disability weight, validity of data sources, etc.
  - If Republic of Korea's research methodology is used, DALYs due to preventable adverse events can be calculated in other countries and can be compared.



# Thank you for listening!

## 감사합니다!

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