



*Unlock the Secrets to Better Care:  
A Data-Driven Approach to Improving Health Outcomes*  
Webinar Toolkit

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# Leapfrog | Claims Data Analytics

April 2025

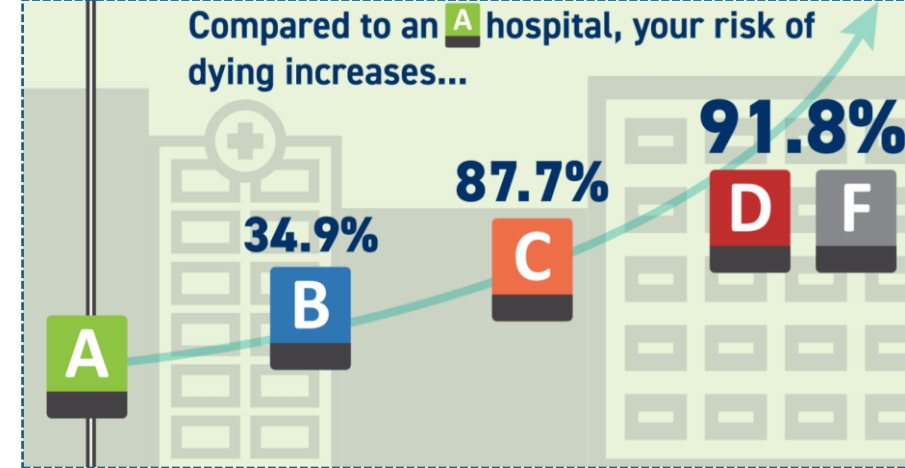


# Making a Case



Why should I care?

- Patient health and safety is the top priority.
  - Patients' risk of death increases by **92%** within poor quality hospitals.
- **25%** of consumers will be harmed during a healthcare encounter. <sup>1</sup>
- Quantifiably avoidable deaths among health plan constituents. <sup>2</sup>
  - **16 avoidable deaths** for a health plan with 50,000 enrolled members.
- **\$39,000** more per patient, per post-surgical complications <sup>3</sup>
  - Estimates of IP surgical complications range from 3% to 17% <sup>3</sup>
  - 60,000 employee health system → 4,000 IP surgeries → 400 readmissions (10% of admits) → **+\$1.2M for complications**
  - Median LOS 4x for surgical patients who developed one or more avoidable complications (3 days vs. 14 days) <sup>3</sup>.
  - This is a) **Avoidable** and b) **Identifiable** risk.
- COEs, designed with quality, safety, and outcomes in mind, continue to be the leading strategy among employer health plans to drive change on costs and outcomes. <sup>4</sup>



<sup>1</sup> Adverse Events in Hospitals: A Quarter of Medicare Patients Experienced Harm in October 2018, OIG

<sup>2</sup> Leapfrog Lives and Dollars Lost calculator combined with proprietary health plan claims data.

<sup>3</sup> Relationship Between Occurrence of Surgical Complications and Hospital Finances, JAMA (2013)

<sup>4</sup> 2025 Employer Health Care Strategy Survey, Business Group on Health

# Measuring Quality

## Traditional Types of Healthcare Quality Measures

- The following measures are important to understand in the context of the hospital safety grade.

### Structural Measures

*Are the right measures in place to keep patients safe and provide quality care?*

- Whether the health care organization uses electronic medical records or medication order entry system.
- The number or proportion of board-certified physicians.

### Outcomes Measures

*How are patients being impacted by the care provided?*

- The rate of healthcare associated infections.
- The rate of falls with trauma or surgical complications.

### Process Measures

*Are evidence-based clinical guidelines being followed?*

- The percentage of women undergoing c-sections who received DVT prophylaxis prior to incision.
- The percentage of newborns who had their bilirubin levels tested prior to discharge.

Type	Example (Diabetes)	Collection Burden	Time Horizon	Control over Result	Connection to Value
<b>Structure</b>	Access to HbA1c Testing	Low 😊	Now 😊	Very High 😊	Low 😞
<b>Process</b>	% of Patients with Recent HbA1c Test	Moderate 😊	~ 1 year 😊	High 😊	Moderate 😊
<b>Intermediate Outcome</b>	HbA1c Control	High 😞	~ 2 years 😊	Moderate 😊	High 😊
<b>Long-Term Outcome</b>	Diabetes-Related Hospitalizations	High 😞	3+ years 😞	Low 😞	Very High 😊

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# Use Cases for Leapfrog Data

## Health Plans

- ✓ Integrate into existing pay-for-performance programs or value-based purchasing arrangements
- ✓ Develop a tiering methodology
- ✓ Identify Centers of Excellence (COEs)
- ✓ Work with employers to establish preferred facilities or narrow networks
- ✓ Display data for health plan members on a provider finder website
- ✓ Work with a transparency vendor to incorporate Leapfrog data into decision support tools

## Self-Insured Entities

- ✓ Design benefits plans
- ✓ Build narrow networks
- ✓ Calculate payments
- ✓ Execute tiering and direct contracting
- ✓ Healthcare steerage

## Employers

- ✓ Build narrow networks
- ✓ Calculate incentive payments or penalties
- ✓ Execute tiering and direct contracting
- ✓ **Unique opportunity for health care employers \***

## Consultants

## Researchers

- ✓ Leverage Leapfrog data for studies to further legitimize findings, leading to publications

## Transparency Vendors

- ✓ Integrate Leapfrog data with cost data to show which hospitals offer the best value for consumers
- ✓ Help health plans highlight where to steer members
- ✓ Identify which hospitals are transparent about their performance on quality and safety metrics

# Leapfrog Hospital Safety Grade vs. Leapfrog Hospital Survey

What do we have available to us?

## Leapfrog Hospital Survey



Hospitals voluntarily submit Surveys to demonstrate their commitment to transparency. The Survey only reports data voluntarily submitted by hospitals across the country (*represents about 75% of all hospital beds in the U.S.*).



The Leapfrog Hospital Survey covers a variety of quality, safety, and resource use measures.



A hospital's progress on each measure is displayed. This spans categories of performance related to never events, maternity outcomes, and medication administration.

Fit for more granular analyses.

## Leapfrog Safety Grade



Hospitals with available data are given grades regardless of participation in the Survey. The Safety Grade includes data from CMS and the Survey (*if available*).



Exclusively focused on safety. Other measures are not considered.

Hospitals receive a single letter grade – A through F – based on their overall safety performance.



Fit for high-level analyses evaluating the rate of care consumed at unsafe providers.

# ■ Tying Leapfrog Data to Claims Data

## Data Source

Data Warehouse (e.g. Merative, Artemis, Springbuk)  
Health Insurance Carrier

## Reporting Period

Varies according to the Survey and/or Safety Grade iteration  
Incurred data always

## Reporting Fields

Provider Name	ICD-10 Diagnosis Category	Allowed Amount
Provider NPI	ICD-10 Diagnosis Code	Paid Amount
Provider TIN	ICD-10 Diagnosis Description	Visits
Service Category	CPT Code	Patients
Place of Service	CPT Code Description	
Network Tier Indicator	Revenue Billing Code	

Approximately 50% of health plan dollars are related to claims among providers that Leapfrog does not report on.

### Claims w/o associated Leapfrog data:

- × Professional level services (excluding inpatient)
- × Office visits
- × Office setting, laboratory

### Claims w/ associated Leapfrog data:

- ✓ Inpatient and outpatient hospital services
- ✓ Emergency room services
- ✓ Inpatient behavioral health care
- ✓ Outpatient laboratory services



# Actionable Data

- ❖ Billing Ethics
- ❖ Health Equity
- ❖ Informed Consent
- ❖ CPOE
- ❖ BCMA
- ❖ Medication Reconciliation
- ❖ Safe Surgery Checklist Score
- ❖ Carotid Endarterectomy
- ❖ Mitral Value Repair and Replacement

- ❖ Open Aortic
- ❖ Norwood Procedures
- ❖ Lung Resection for Cancer
- ❖ Esophageal Resection for Cancer
- ❖ Pancreatic Resection for Cancer
- ❖ Rectal Cancer Surgery
- ❖ Bariatric Surgery for Weight Loss
- ❖ Total Knee Replacement
- ❖ Total Hip Replacement

- ❖ Maternity Care Volume
- ❖ Maternity EED Policy
- ❖ C-Section
- ❖ Episiotomy
- ❖ Newborn Bilirubin
- ❖ High-Risk Delivery Rate
- ❖ NICU Outcomes
- ❖ Never Event
- ❖ Never Events Waive Costs



The information above speaks to the more granular, actionable components of the Survey report. The Safety Grade is a single value, more fit for high-level analytics. It can be used to inform general network steering strategy, domestic steering efforts, and narrow network development, among other uses.



# Case 1: Safety Grade Use – General

## Employer

Healthcare industry | 25k EEs | 50k Mbrs | ~\$385M budget

## Source

Data Warehouse

## Time Period

January 1, 2023 – December 31, 2023 (Incurred)

## Report Build

1) Provider Name, 2) Service Category, 3) Place of Service, 4) Network Tier Indicator, 5) ICD-10 Code, 6) CPT Code, 7) IP Admit Indicator, 8) Re-admission Indicator

## Codes Considered

N/a

## Method

Map Safety Grades from the proprietary data file to the client's claims report using NPIs in excel.



**10%** of graded claims account for 50% of spend.



**37%** of graded claims paid at C and D providers, 85% of which is domestic.



**1k** inpatient admissions across 750 members at C and D hospitals.



**55%** higher incidence rate of readmissions at D hospitals relative to A hospitals | **20%** higher at C hospitals.



**35%** higher average admission cost at D providers relative to A providers (↑ % of complications).

### Opportunity

- ✓ Redirect care to alternative domestic provider(s) for cancer and circulatory care. There are two alternative domestic providers within a 25 minute or less drive.
  - A. Maintains domestic utilization
  - B. Opportunity to improve care delivery at C rated providers (*sepsis and provider communication challenges*)

# Case 2: Survey Use – Maternity

## Employer

Healthcare industry | 30k EEs | 60k Mbrs | ~\$400M budget

## Source

Data Warehouse

## Time Period

January 1, 2023 – December 31, 2023 (Incurred)

## Report Build

1) Member Identifier, 2) Member Address, 3) Provider Name, 4) Provider NPI, 5) Network Tier Indicator, 6) Diagnosis Related Grouper, 7) ICD-10 Diagnosis Code, 8) CPT Code,

## Codes Considered

DRG Code 765, 766, 783 to 788 | Driving CPT codes include 59510 | Driving ICD-10 codes include 034211, 034219, and 082; Complications appear in the “06” series of ICD-10 codes.

## Method

Map c-section results from the Leapfrog Survey Results proprietary data file to the client’s claims report using excel.



**50%** of members with a c-section had the procedure performed at a provider with Some Achievement or Limited Achievement (levels 1 and 2 of 4)

- 23.6% is the standard, while Some Achievement and Limited Achievement fall into the range of 25.2% - 29.5% and 29.5% +, respectively.
- **85%** of which is made up of domestic providers.



In this case study costs (*normalized*) were actually shown to be highest at providers with Considerable Achievement, however complications and harm were nearly 20% more common at providers with Some or Limited Achievement.

### Opportunity

- ✓ Redirect care to alternative domestic provider for deliveries. 75% of patients live within 15 minutes of the better performing facility.
  - A. Maintains domestic utilization
  - B. Opportunity to improve care delivery at domestic provider(s) with Some or Limited Achievement
  - C. “Safer” alternative according to Leapfrog Safety Grade
- ✓ Modify domestic benefit design to steer to specific facilities

# ■ Leapfrog Data x Claims Data



The **Leapfrog Survey** and **Safety Grade** are two of many tools available to health plan constituents – not the primary bases for strategic recommendations but supporting data instead.

- Add these tools to your “toolbox” to help inform strategy with a deeper level of analysis.



The most informative outcomes from tying Leapfrog data to claims information often pertain to **network design** and **steerage strategy**.

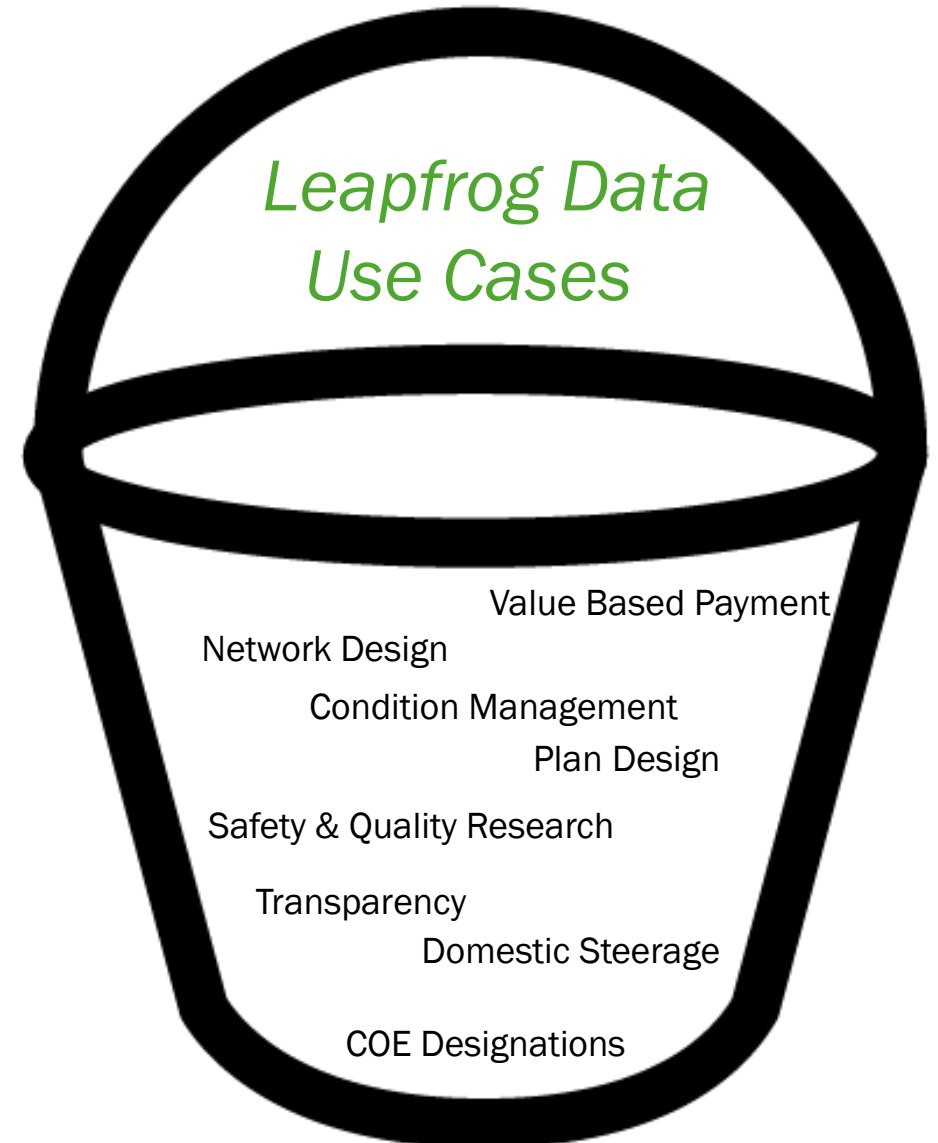
## Future Analytic Opportunities

Identify the prevalence of never events via claims data using ICD-10 codes, CPT codes, revenue codes, etc.



Broadly analyze the prevalence of post-surgical complications using the T81 series of ICD-10 codes to identify problem providers.

Alternative condition-specific analyses (e.g. cardiovascular and musculoskeletal).





# THANK YOU

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Questions? Comments?



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# **Lives Lost, Lives Saved: An Updated Comparative Analysis of Avoidable Deaths at Hospitals Graded by The Leapfrog Group**

**May 2019**

by

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Prepared for The Leapfrog Group, Washington, D.C.

## **About the Armstrong Institute**

Established in 2011, the Armstrong Institute partners with patients, their loved ones, and all interested parties to end preventable harm, to continuously improve patient outcomes and experience, and to eliminate waste in health care delivery, both at Johns Hopkins and around the world. Created with a gift from C. Michael Armstrong, former chairman of the Johns Hopkins Medicine Board of Trustees, the institute develops and tests solutions in safety and quality improvement that can then be shared at the regional, national and global levels. Using a scientific approach to improvement, the organization employs robust measures that can be broadly disseminated and sustained. More information about the Armstrong Institute is available at [hopkinsmedicine.org/armstrong\\_institute/](http://hopkinsmedicine.org/armstrong_institute/).

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## **Introduction**

In 2012, in an effort to provide patients and health care consumers with information on the safety of their local hospitals, The Leapfrog Group introduced the Hospital Safety Grade, a letter grade rating for hospitals on how safe they are for patients. The Hospital Safety Grade is a composite score of 28 measures of patient safety that are all currently used in national measurement and reporting programs. The Hospital Safety Grade uses performance measures from the Leapfrog Hospital Survey, the Centers for Medicare and Medicaid Services (CMS), and secondary data sources. Hospital Safety Grades are assigned twice a year (in the spring and fall) to more than 2,600 hospitals across the nation. From the calculated scores, hospitals are assigned a letter grade ranging from A to F, with “A” hospitals having the highest scores and “F” hospitals having the lowest scores.

Leapfrog’s membership of employers and other purchasers of health care are interested in helping consumers understand the relative risk of using an “A” hospital versus hospitals that receive lower grades. Leapfrog asked the Armstrong Institute to update its original 2016 analysis of the estimated number of avoidable deaths in hospitals with each letter grade (“A” vs. “B” vs “C” vs “D, F”) and how many lives could be saved if all hospitals in the U.S. that receive a Hospital Safety Grade had a safety record of “A” hospitals.

## **Methods**

### ***Measures Used***

Fifteen outcome measures and one structural measure from the Spring 2019 Hospital Safety Grade were used in the analysis. The measures included in the analysis were those for which the literature has clearly identified an attributable mortality to the patient safety event or a closely-related prevention process. Table A (Appendix) reflects the list of measures used in the analysis, the data source for each measure, and the reporting period covered by the measure.

### ***Estimating Incidence of Errors***

Using data from those hospitals that received a Spring 2019 Leapfrog Hospital Safety Grade, the mean incidence rate of each patient safety outcome was calculated for “A” hospitals in aggregate, “B” hospitals in aggregate, “C” hospitals in aggregate, and “D” and “F” hospitals together in aggregate. Table 1 reflects the mean incidence rate for each patient safety outcome for hospitals in each letter grade.

### ***Estimating Mortality Risk***

The published literature was reviewed to identify the average attributable mortality rate associated with each patient safety outcome when it occurs in the inpatient setting. The attributable mortality rates and the source of those data points are listed in Table 1. As the literature did not typically distinguish differences in mortality between better and worse

performing hospitals, the same mortality rate was used for hospitals of all letter grades. The one exception to this is for Patient Safety Indicator 4 (PSI 04): Death among Surgical Inpatients with Serious Treatable Complications. For this measure, a hospital's score on the measure reflects the mortality rate when a serious, treatable complication occurs. As such, for this measure, we could aggregate data across each letter grade to determine a grade-specific mortality rate. The literature did not support any attributable mortality rate for Hospital-Acquired Conditions (HAC): Air Embolism.

While higher adherence to process and structural measures is generally linked to improvements in patient safety and care quality, the literature did not identify quantifiable reductions in mortality rates through improved performance for most of the process and structural measures used in the Hospital Safety Grade. However, one structural measure used in the Hospital Safety Grade, Intensive Care Unit (ICU) Physician Staffing, does have identifiable reductions in mortality risk. It is estimated that full implementation of Leapfrog's ICU Physician Staffing (IPS) standard by all U.S. hospitals could reduce ICU mortality by 30% — from 12% to 8.4%.<sup>1</sup> We assumed a linear relationship between a hospital's adoption of Leapfrog's standard and reductions in mortality rates. Table 2 reflects the estimated excess mortality above 8.4% for each letter grade attributable to lack of full adoption of Leapfrog's IPS standard.

### ***Calculating Mortality Rates per 1,000 Admissions***

To estimate the mortality rate for each patient safety outcome in hospitals in each letter grade, we multiplied the mortality rate for each outcome measure by the respective mean incidence rate of that outcome for each Hospital Safety Grade letter grade. As some measures apply only to certain kinds of admissions, such as surgical admissions or ICU admissions, we multiplied the mortality rates by the percentage of all admissions that apply to that measure. From the literature, we identified that 29% of all U.S. hospital admissions involve a procedure in the operating room<sup>2</sup> and 20% include an ICU admission.<sup>3</sup>

To estimate the impact of the lack of full adoption of Leapfrog's ICU Physician Staffing standard on patient mortality, we multiplied the incremental mortality rate by the percentage of hospital admissions that are admitted to the ICU.

While the literature we used to estimate the mortality rates for each preventable harm would ideally reflect the mortality that is directly attributable to that preventable harm in isolation, we recognize that some of the estimated mortality risk may be counted across multiple measures. To account for this limitation, we reduced the mortality associated with the outcome measures by 50%.



**Table 1.** Mean Incidence Rate of Patient Safety Outcomes for Hospitals in Each Spring 2019 Letter Grade and the Average Attributable Mortality Rate for Each Outcome.

Measure	Mean Incidence Rate of Patient Safety Outcome per 1,000 Hospital Admissions (Based on Spring 2019 grades)				Identified Attributable Mortality Rate
	A	B	C	D & F Combined	
Hospital-Acquired Conditions (HAC): Foreign Object Retained After Surgery	0.00%	0.00%	0.00%	0.01%	2.14% <sup>4</sup>
Hospital-Acquired Conditions (HAC): Falls and Trauma	0.03%	0.04%	0.05%	0.06%	5.50% <sup>5</sup>
Hospital-Acquired Conditions (HAC): Air Embolism	0.00%	0.00%	0.00%	0.00%	No identified mortality rate
Central Line-Associated Blood Stream Infection (CLABSI)	0.12%	0.16%	0.18%	0.24%	18.5% <sup>5</sup>
Catheter-Associated Urinary Tract Infection (CAUTI)	0.14%	0.17%	0.19%	0.23%	2.3% <sup>5</sup>
Surgical-Site Infections from Colon Surgery (SSI: Colon)	0.01%	0.01%	0.01%	0.01%	2.8% <sup>5</sup>
Hospital-onset Methicillin-resistant Staphylococcus Aureus (MRSA) Laboratory-identified Blood Infections	0.02%	0.03%	0.04%	0.05%	22.6% <sup>6</sup>
Hospital-onset Clostridium Difficile (C.diff.) Laboratory-identified Infections	0.32%	0.36%	0.39%	0.38%	23.00% <sup>7</sup>
Patient Safety Indicator 3: Pressure Ulcer Rate	0.03%	0.04%	0.04%	0.06%	7.23% <sup>4</sup>
Patient Safety Indicator 4: Death Among Surgical Inpatients with Serious Treatable Complications	0.63%	0.64%	0.65%	0.64%	A: 15.82% B: 16.05% C: 16.37% DF: 17.19%  Note: Values are calculated from the actual PSI 04 data
Patient Safety Indicator 6: Iatrogenic Pneumothorax	0.03%	0.03%	0.03%	0.03%	6.99% <sup>4</sup>
Patient Safety Indicator 11: Postoperative Respiratory Failure	0.76%	0.81%	0.88%	0.94%	21.84% <sup>4</sup>
Patient Safety Indicator 12: Postoperative Pulmonary Embolism (PE) or Deep Vein Thrombosis (DVT)	0.36%	0.38%	0.40%	0.44%	6.56% <sup>4</sup>
Patient Safety Indicator 14: Postoperative Wound Dehiscence	0.08%	0.08%	0.09%	0.09%	9.63% <sup>4</sup>
Patient Safety Indicator 15: Accidental Puncture or Laceration	0.12%	0.13%	0.13%	0.14%	2.16% <sup>4</sup>

**Table 2.** Estimated Excess ICU Mortality Attributed to Lack of Full Adoption of Leapfrog’s IPS Standard based on Spring 2019 grades.

	<b>Excess ICU Mortality Rate by Spring 2019 Letter Grade</b>				<b>Note</b>
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D &amp; F Combined</b>	
ICU Physician Staffing	1.01%	1.53%	2.34%	2.37%	Values are calculated from actual data; values reflect the incremental mortality above 8.4% due to the lack of hospitals’ full adoption of Leapfrog’s IPS standard <sup>1</sup>

**Hospital Admissions**

We used data from the 2017 American Hospital Association’s Annual Survey to identify the number of acute care hospital admissions across the United States (34,305,620)<sup>8</sup> and how those admissions distribute across hospitals in each Hospital Safety Grade letter grade.

**Lives Lost and Lives Saved**

We used the distribution of hospital admissions across each Hospital Safety Grade letter grade with the number of lives lost per 1,000 admissions per letter grade to estimate the total number of lives lost for hospitals in each letter grade. We also used these data to calculate the number of lives that would be saved if hospitals with grades lower than “A” operated as safely as “A” hospitals.

**Results**

Table 3 reflects the key results of the analysis. The number of avoidable deaths per 1,000 admissions ranged from 3.24 lives per 1,000 admissions in “A” hospitals to 6.21 lives per 1,000 admissions in “D” and “F” hospitals. Compared to “A” hospitals, the differences in the estimated relative risk of an avoidable death is 34.9% higher in “B” hospitals, 87.7% higher in “C” hospitals, and 91.8% higher in “D” and “F” hospitals. It is important to recognize, however, that these results reflect average hospital performance in each grade category and individual hospital performance within a letter grade may vary.

**Table 3.** Rate of Avoidable Deaths per 1,000 Admissions and the Possible Lives Saved with Improved Performance based on Spring 2019 grades.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D &amp; F Combined</b>
Lives Lost/1,000 Admissions	3.24	4.37	6.08	6.21
Relative Risk of an Avoidable Death Compared to "A" Hospitals		34.9%	87.7%	91.8%
Distribution of Hospital Admissions	33.4%	25.4%	35.7%	5.5%
Lives Saved if All Hospitals Had an "A" Safety Record		9,835	34,775	5,605

Applying the mortality rates for each grade of hospital to the distribution of hospital admissions in 2017, we estimate 161,250 avoidable deaths in U.S. hospitals each year (37,085 in "A" hospitals, 38,038 in "B" hospitals, 74,414 in "C" hospitals, and 11,712 in "D," and "F" hospitals). We estimate 50,215 lives could be saved every year if "B" "C","D", and "F" hospital had the same safety performance as "A" hospitals.

**Conclusions**

Efforts to reduce patient safety events have been plentiful, and yet elimination of all preventable harms remains elusive. While hospitals with a Hospital Safety Grade of "A" have better performance than hospitals with lower grades, they still have significant opportunities for improvement. If hospitals with a grade lower than an "A" are able to achieve the safety performance of "A" hospitals, we estimate more than 50,000 patient lives could be saved.

The measures included in this analysis reflect a subset of all potential harms that patients may encounter in U.S. hospitals, and as such, these results likely reflect an underestimation of the avoidable deaths in U.S. hospitals. Also, we have only estimated the deaths from patient safety events and have not captured other morbidities that may be equally important. And while the absolute numbers presented in this analysis are likely an underestimation of the true impact on patients, the relative comparisons presented in this analysis likely hold across all harms, given that the underestimation is likely consistent across all hospitals.

### ***How this study compares to other studies***

In comparing the results of this updated analysis to the original 2016 analysis, we found a reduced number of lives lost, from an estimated 206,000 in the original analysis to an estimated 160,000 in this updated analysis. This reduction is primarily attributable to two factors – (1) hospitals have made incremental improvements on those performance measures that are included in the Hospital Safety Grade; and (2) some of the performance measures used in the Hospital Safety Grade have been re-defined and re-baselined since the original analysis.

We have seen an increase in the number of lives that could be saved if every hospital had the performance of an “A” hospital, with an estimated 33,000 lives saved in the original analysis to an estimated 50,000 lives saved in this updated analysis. This increase is reflective of “A” hospitals improving at a faster rate than hospitals in the other grade categories.

Other studies that have estimated the number of lives lost from medical error range from 44,000 to 440,000,<sup>9,10</sup> with our estimate falling in the middle of that range. We believe our results are an underestimation of the total impact of avoidable death in U.S. hospitals as our results cover a subset of potential harms suffered by patients.

### ***Limitations***

This analysis only utilized measures of patient safety harm included in the Spring 2019 Hospital Safety Grade. There are a number of patient safety harms that are not currently measured and publicly reported. Examples include medication errors and diagnostic errors. The estimates of lives lost in this analysis are likely to be conservative.

The mortality rates we used in the analysis were generally the same for all hospitals. One might hypothesize that safer hospitals may actually have lower mortality rates when one of these events occurs. This would exaggerate differences we identified between better and worse performing hospitals.

We cannot quantify the true amount of double-counting of deaths that may occur between the different measures. The literature does not identify the potential impact intensivists have on patient harms in the ICU, so we made a conservative assumption that 50% of the deaths associated with the outcome measures are already captured in the ICU Physician Staffing mortality estimates. The analysis could be refined if one could better understand the impact that the presence of intensivists has on patient harms in the ICU.

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## Appendix

**Table A.** Measures from the Spring 2019 Hospital Safety Grade Used in the Analysis.

	<b>Data Source*</b>	<b>Reporting Period</b>
<b>Outcome Measures</b>		
Hospital-Acquired Conditions (HAC): Foreign Object Retained After Surgery	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Hospital-Acquired Conditions (HAC): Falls and Trauma	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Hospital-Acquired Conditions (HAC): Air Embolism	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Central Line-Associated Blood Stream Infection (CLABSI)	2018 Leapfrog Hospital Survey	07/01/2017 - 06/30/2018
	Centers for Medicare and Medicaid Services (CMS)	04/01/2017 – 3/31/2018
Catheter-Associated Urinary Tract Infection (CAUTI)	2018 Leapfrog Hospital Survey	07/01/2017 - 06/30/2018
	Centers for Medicare and Medicaid Services (CMS)	04/01/2017 – 3/31/2018
Surgical-Site Infections from Colon Surgery (SSI: Colon)	2018 Leapfrog Hospital Survey	07/01/2017 - 06/30/2018
	Centers for Medicare and Medicaid Services (CMS)	04/01/2017 – 3/31/2018
Hospital-onset Methicillin-resistant Staphylococcus Aureus (MRSA) Laboratory-identified Blood Infections	2018 Leapfrog Hospital Survey	07/01/2017 - 06/30/2018
	Centers for Medicare and Medicaid Services (CMS)	04/01/2017 – 3/31/2018
Hospital-onset Clostridium Difficile (C.diff.) Laboratory-identified Infections	2018 Leapfrog Hospital Survey	07/01/2017 - 06/30/2018
	Centers for Medicare and Medicaid Services (CMS)	04/01/2017 – 3/31/2018
Patient Safety Indicator 3: Pressure Ulcer Rate	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 4: Death Among Surgical Inpatients with Serious Treatable Complications	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 6: Iatrogenic Pneumothorax	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 11: Postoperative Respiratory Failure	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 12: Postoperative Pulmonary Embolism (PE) or Deep Vein Thrombosis (DVT)	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 14: Postoperative Wound Dehiscence	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
Patient Safety Indicator 15: Accidental Puncture or Laceration	Centers for Medicare and Medicaid Services (CMS)	10/01/2015 - 06/30/2017
<b>Process/Structural Measure</b>		
ICU Physician Staffing (intensivists managing or co-managing ICU patients)	2018 Leapfrog Hospital Survey	2018
	2017 AHA Annual Survey	2017

\*For hospitals located in Maryland, the Hospital-Acquired Conditions and Patient Safety Indicator data were generated by the Maryland Health Care Commission (MHCC)