30-Day Pediatric Readmissions

Measurement and Prevention

Jay G. Berry, MD MPH

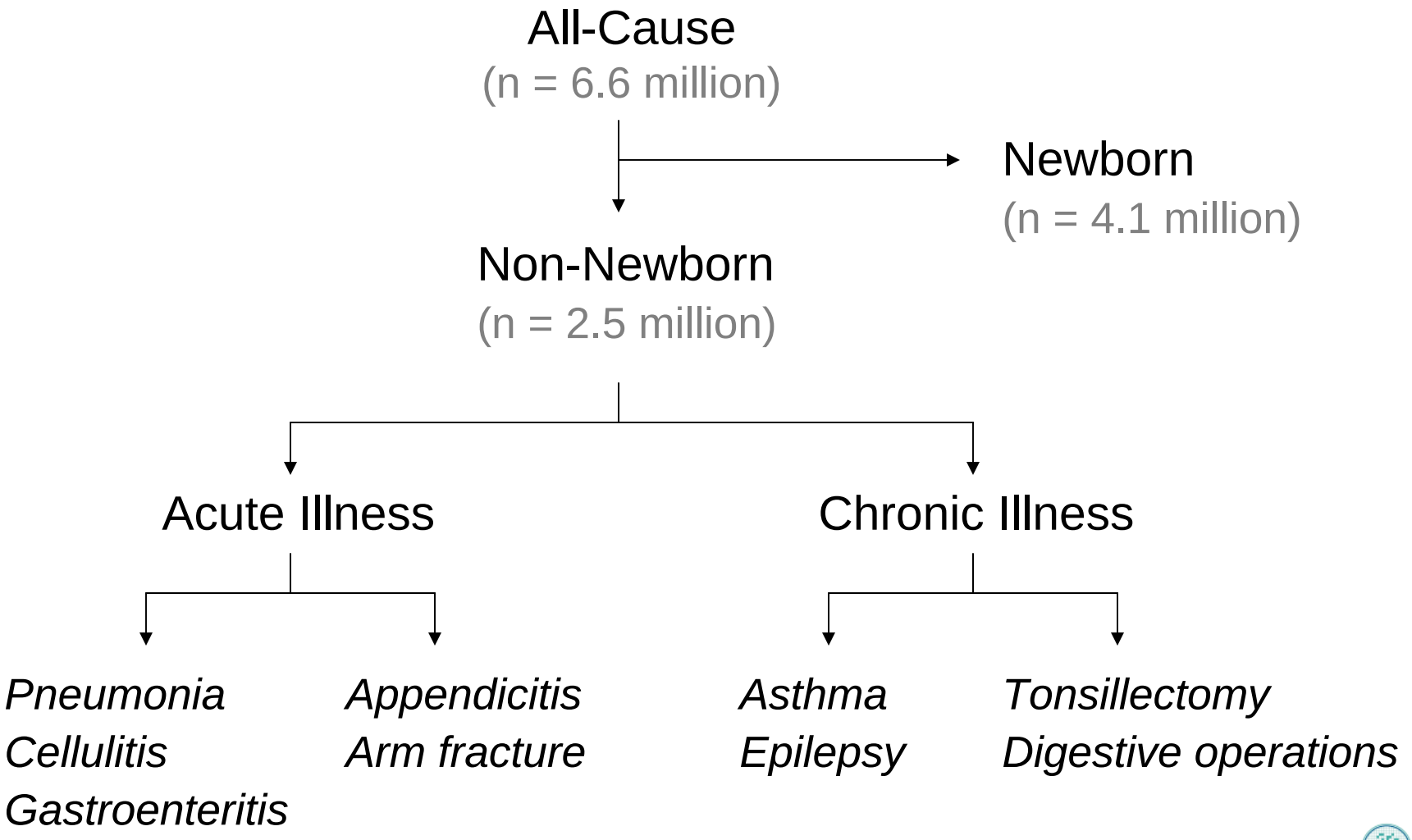
Division of General Pediatrics, Children's Hospital Boston

Harvard Medical School

Pediatric Readmission Outline

- Background of readmissions
- Comparison of readmission metrics
- Conclusions and future directions

Most Prevalent Pediatric Hospitalizations



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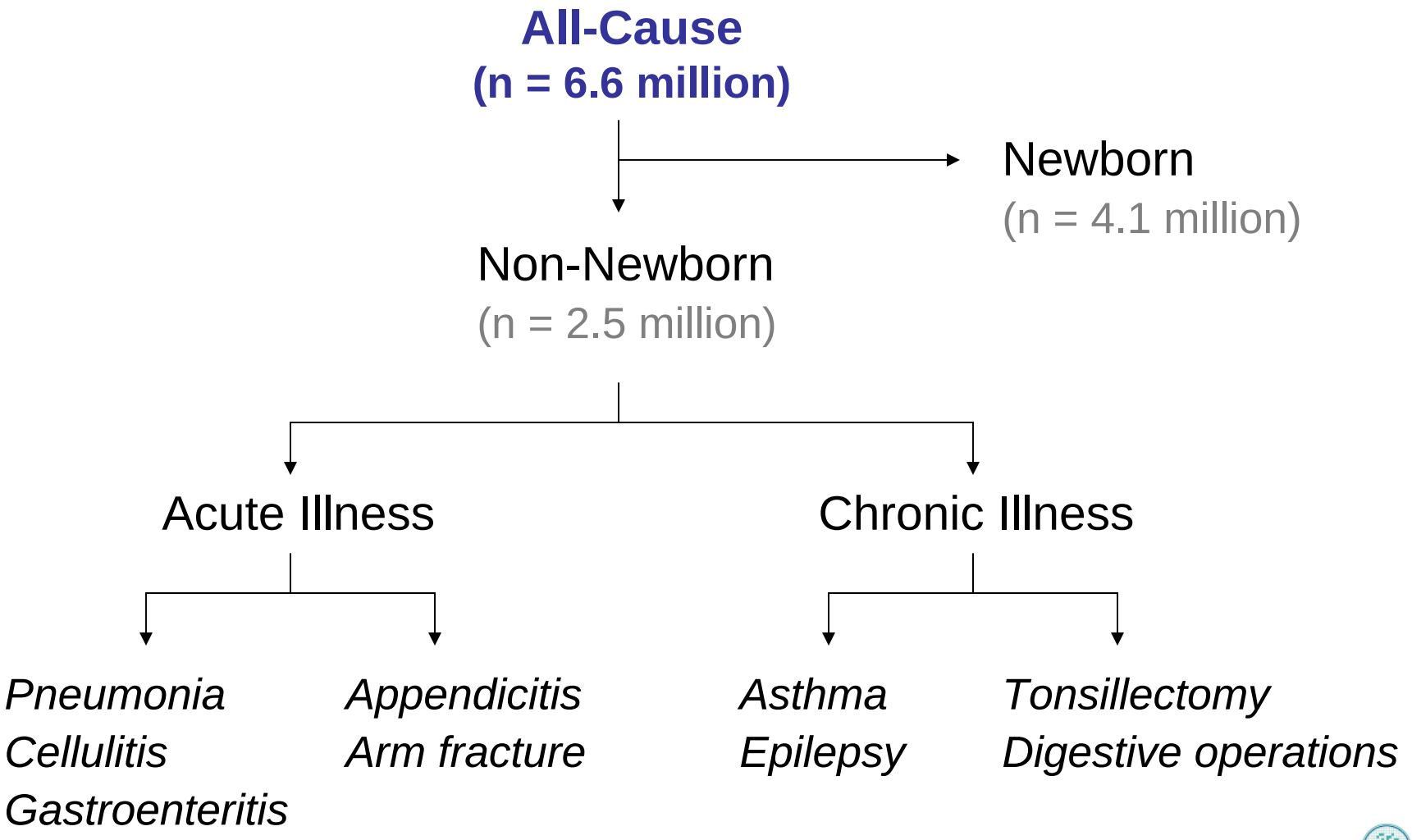

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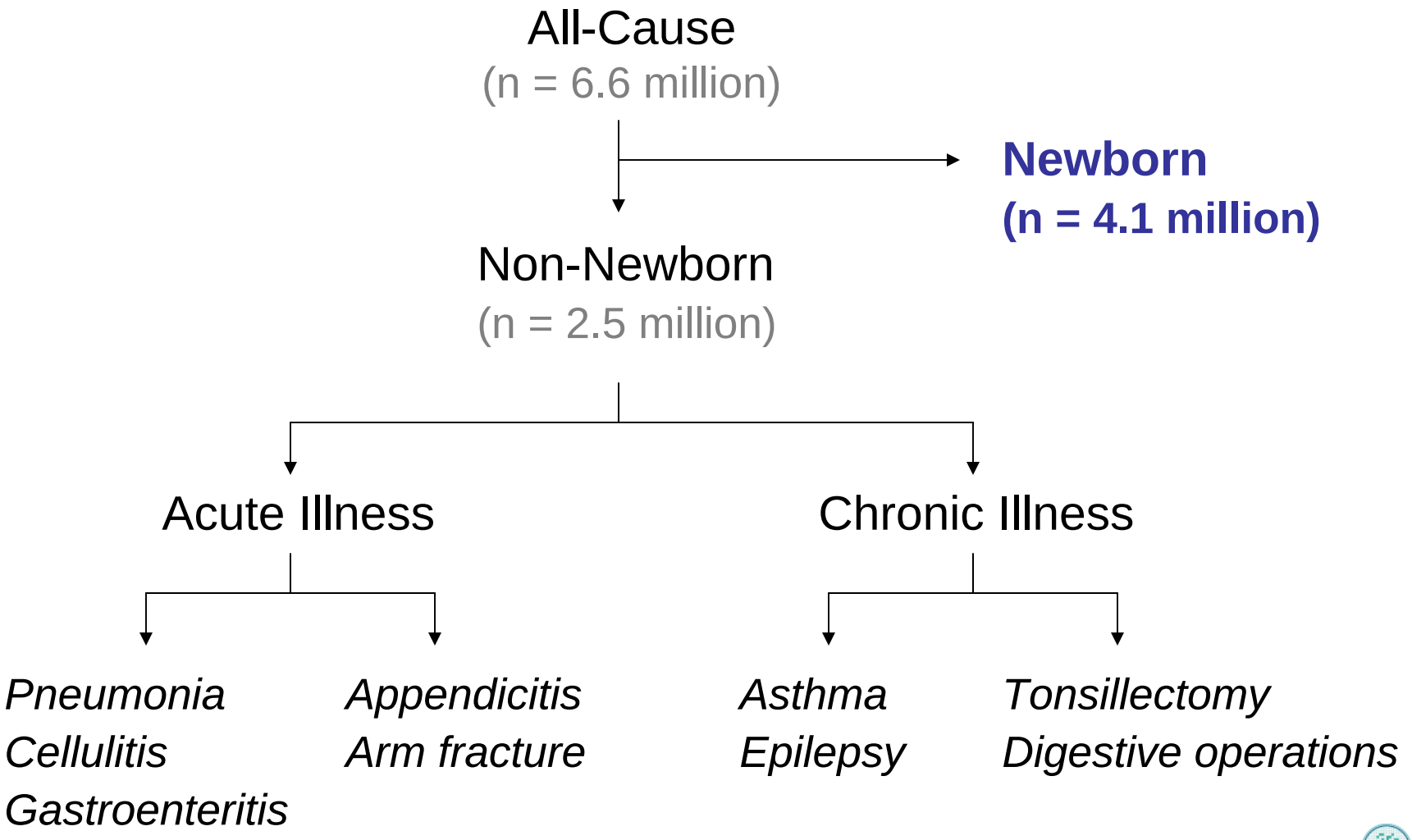

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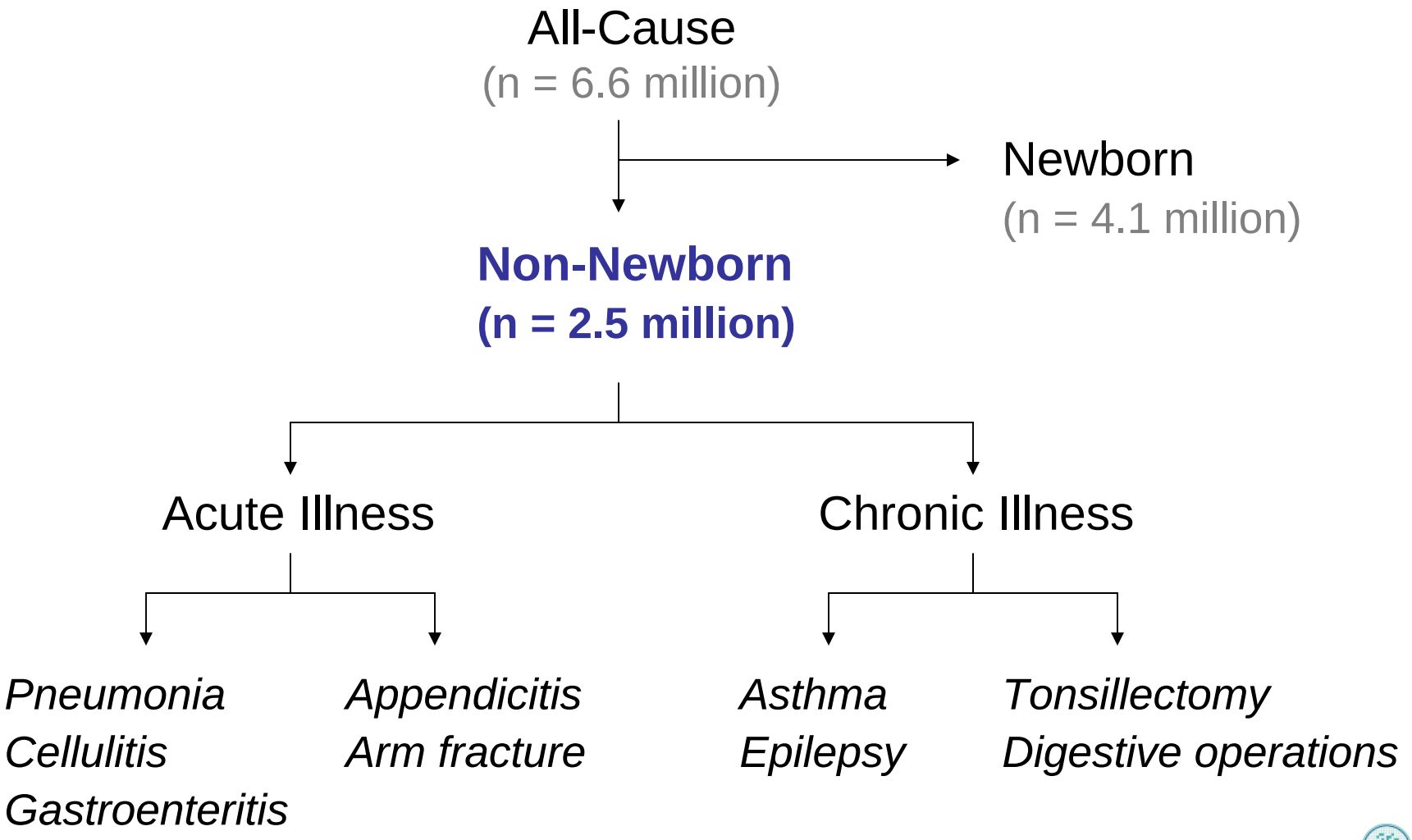

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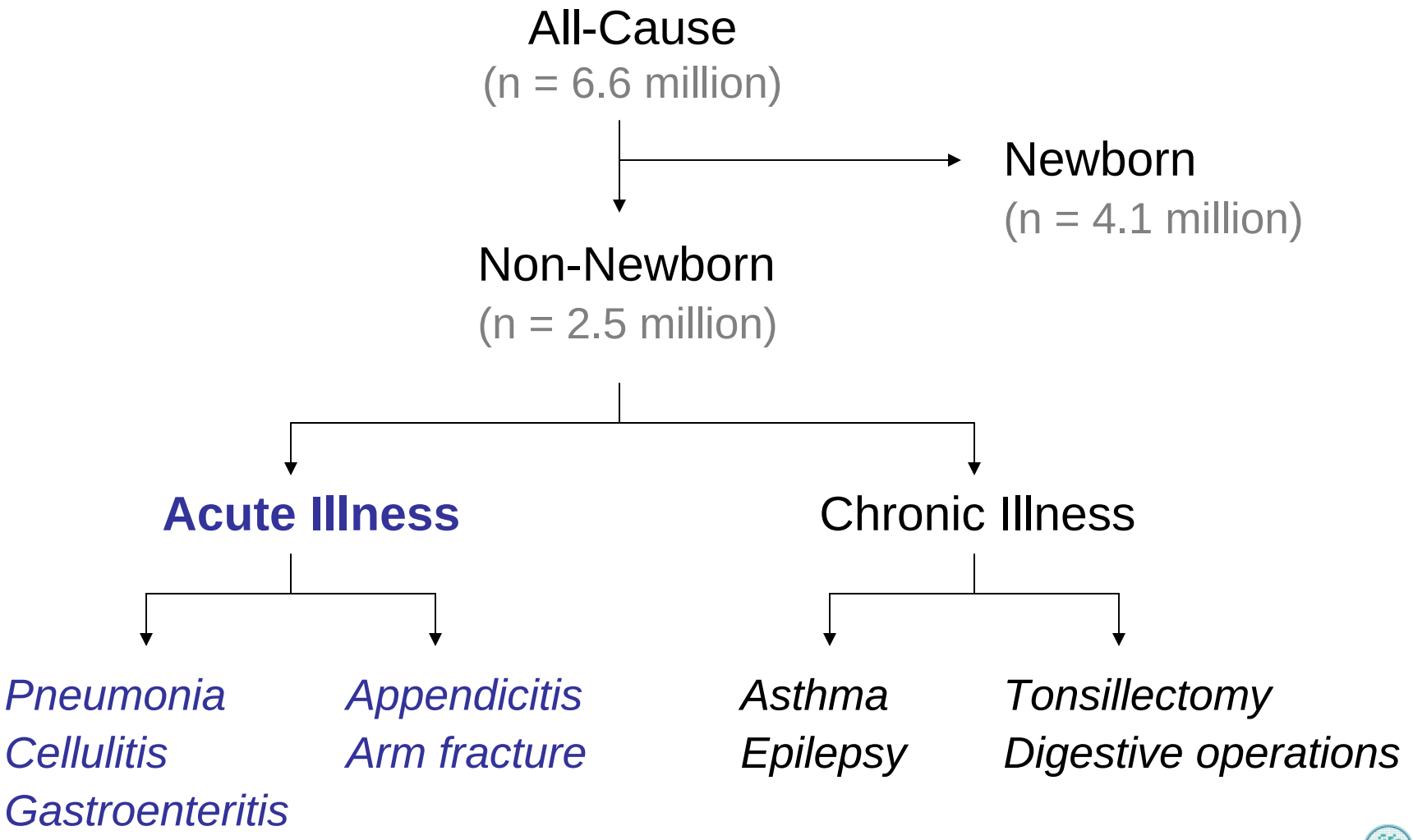

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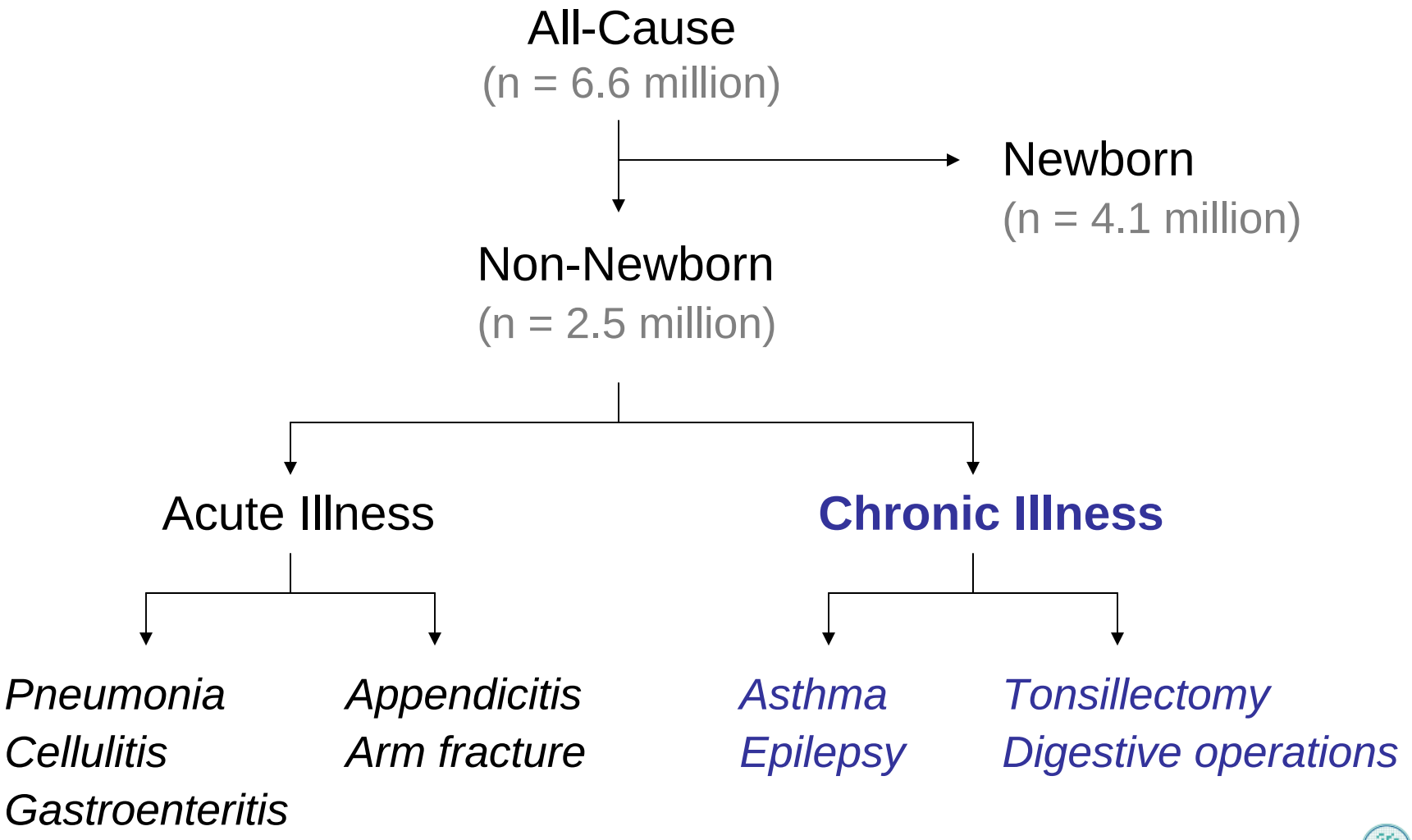
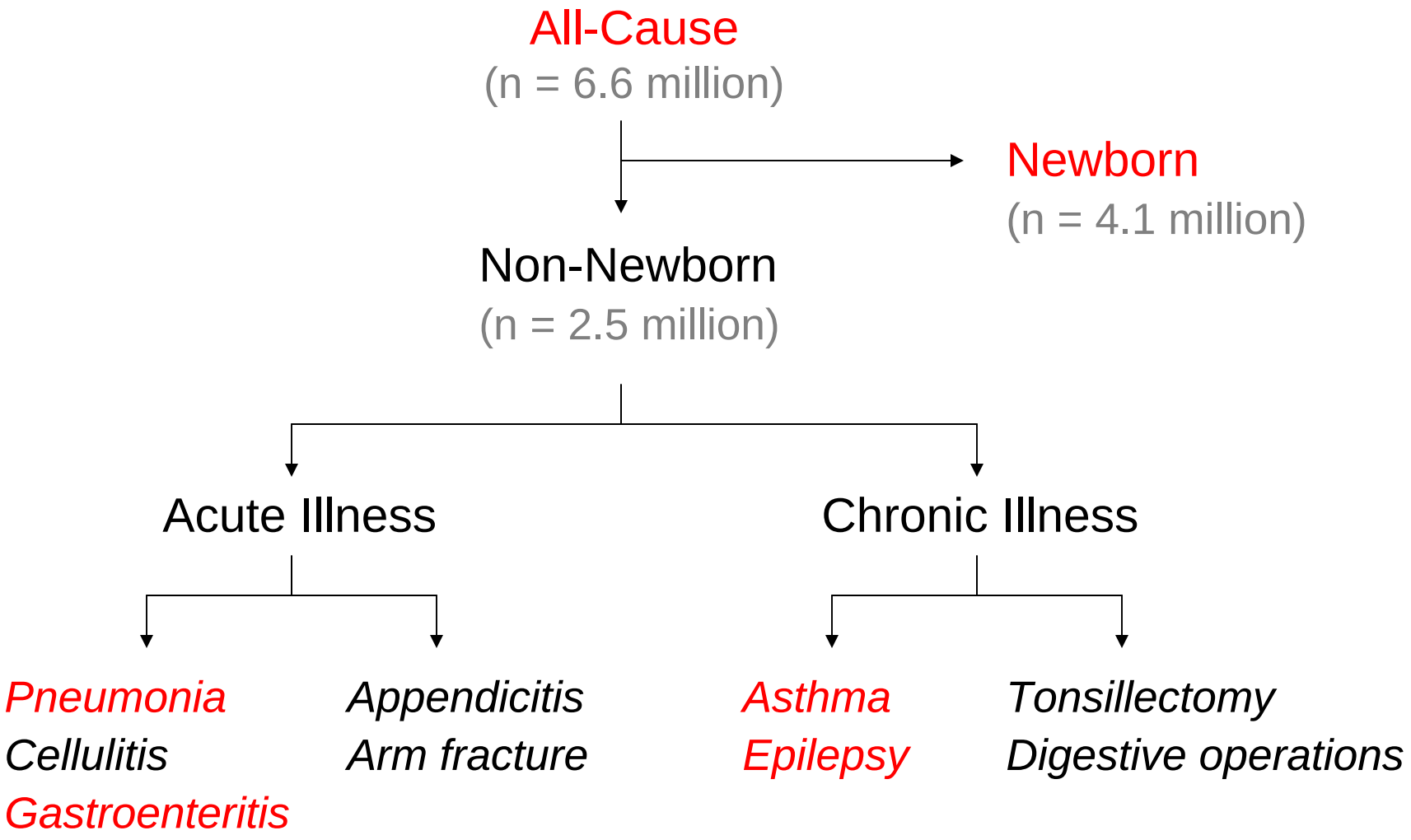


Pediatric Readmission Metrics In Use



Readmission Metrics for Children with Complex Chronic Conditions

- Complex chronic conditions
  - Rare, severe conditions
  - Associated with high care coordination needs, inpatient resource utilization and early readmission

- 30-day readmission
  - Sickle cell disease

    (National Association of Children's Hospitals)

  - Ventricular shunt operations for hydrocephalus

    (National Quality Forum)

Pediatric Readmission Uncertainty

- Impact
  - Prevalence and cost
- Preventability
  - True reasons for readmission
- Attribution
  - Hospital, ambulatory providers, patient / family
- Interpretation
  - Performance comparison

Patient Case-Mix Differences Between Children's and Non-Children's Hospitals

Patient Type	Children's Hospitals (n = 150)	Non-Children's Hospitals (n = 4000)
Children with Complex Chronic Conditions	79%	20%
Healthy Newborns	11%	83%

H·CUP
HEALTHCARE COST AND UTILIZATION PROJECT

Pediatric Readmission Comparison

- Compare the prevalence, cost, prevention and attribution of selected pediatric 30-day readmissions:
  - Newborns
  - Disease-specific acute illnesses
  - Disease-specific chronic illnesses
  - All-cause
    - All children
    - Children with complex chronic conditions

Healthy Newborn Readmissions

- Measure
  - All cause 30-day readmission following hospital discharge for routine, term newborn care
- Exclusions
  - Prematurity
  - Major congenital anomalies
- Data source
  - Peer-reviewed publications
  - Healthcare Cost and Utilization Project (AHRQ)

Healthy Newborn Readmissions

- 30-day readmission = 3%
  - N = 90,000 (national estimate)
  - Cost = $200 million (national estimate)
- Prevention
  - Dehydration and jaundice readmissions
    - 40% of newborn readmissions
    - Non-early discharge for high-risk infants
    - In-hospital bilirubin screening and home treatment programs
- Attribution
  - Shared between inpatient and outpatient providers

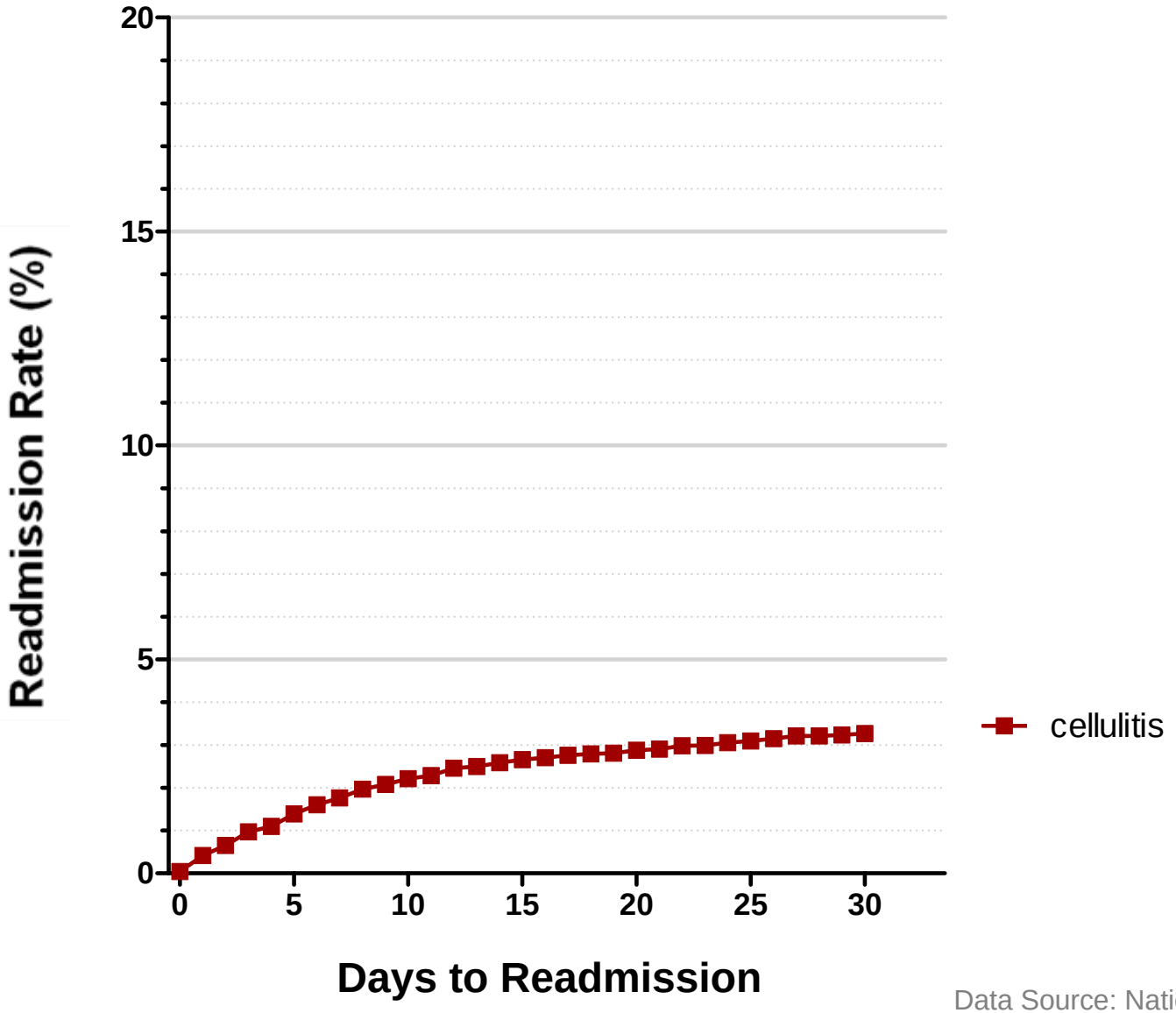
Pediatric Acute Illness Readmissions

- Measure
  - Non-elective 30-day readmission for any reason following an acute illness admission
    - Cellulitis, pneumonia, bronchiolitis, gastroenteritis
    - Appendicitis, arm fractures
- Exclusions
  - Newborns
  - Oncology patients

Pediatric Acute Illness Readmissions

- Data Source
  - National Association of Children's Hospitals and Related Institutions Case-Mix Dataset
  - Administrative data of 667,543 hospitalizations from 87 children's hospitals in 2009
  - Unique patient identifiers permit tracking across multiple hospitalizations

Pediatric Acute Illness Readmission Rates



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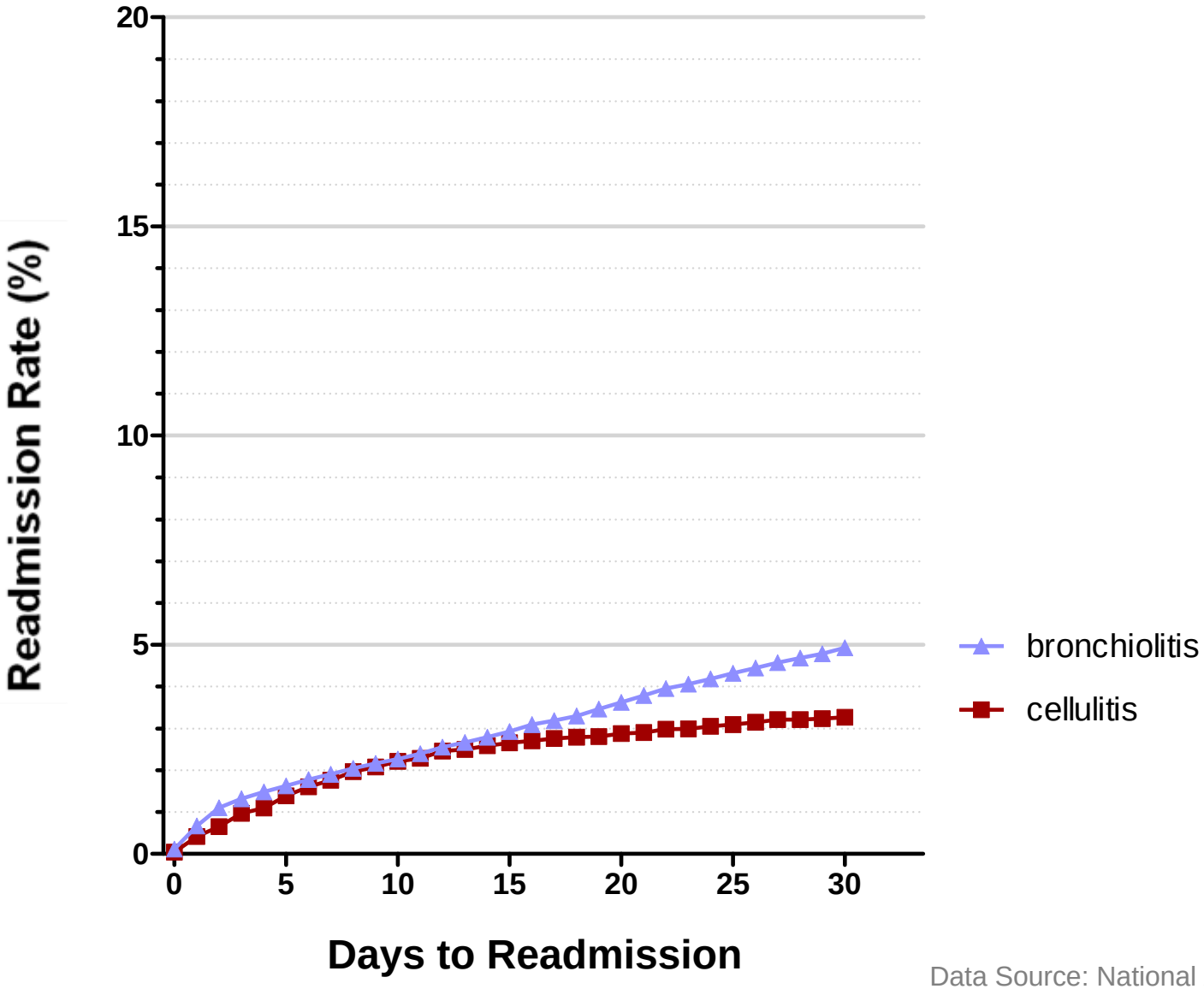

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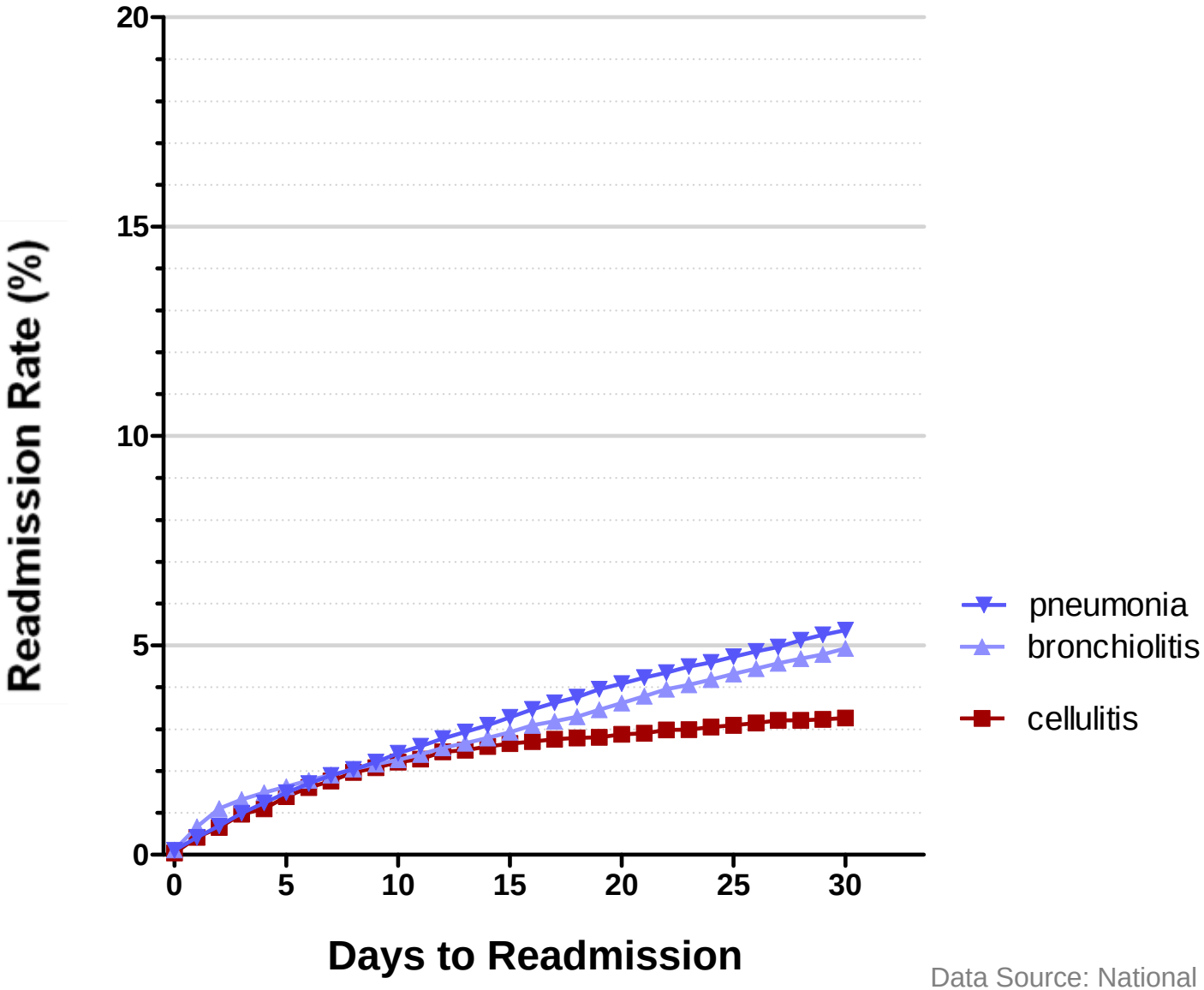

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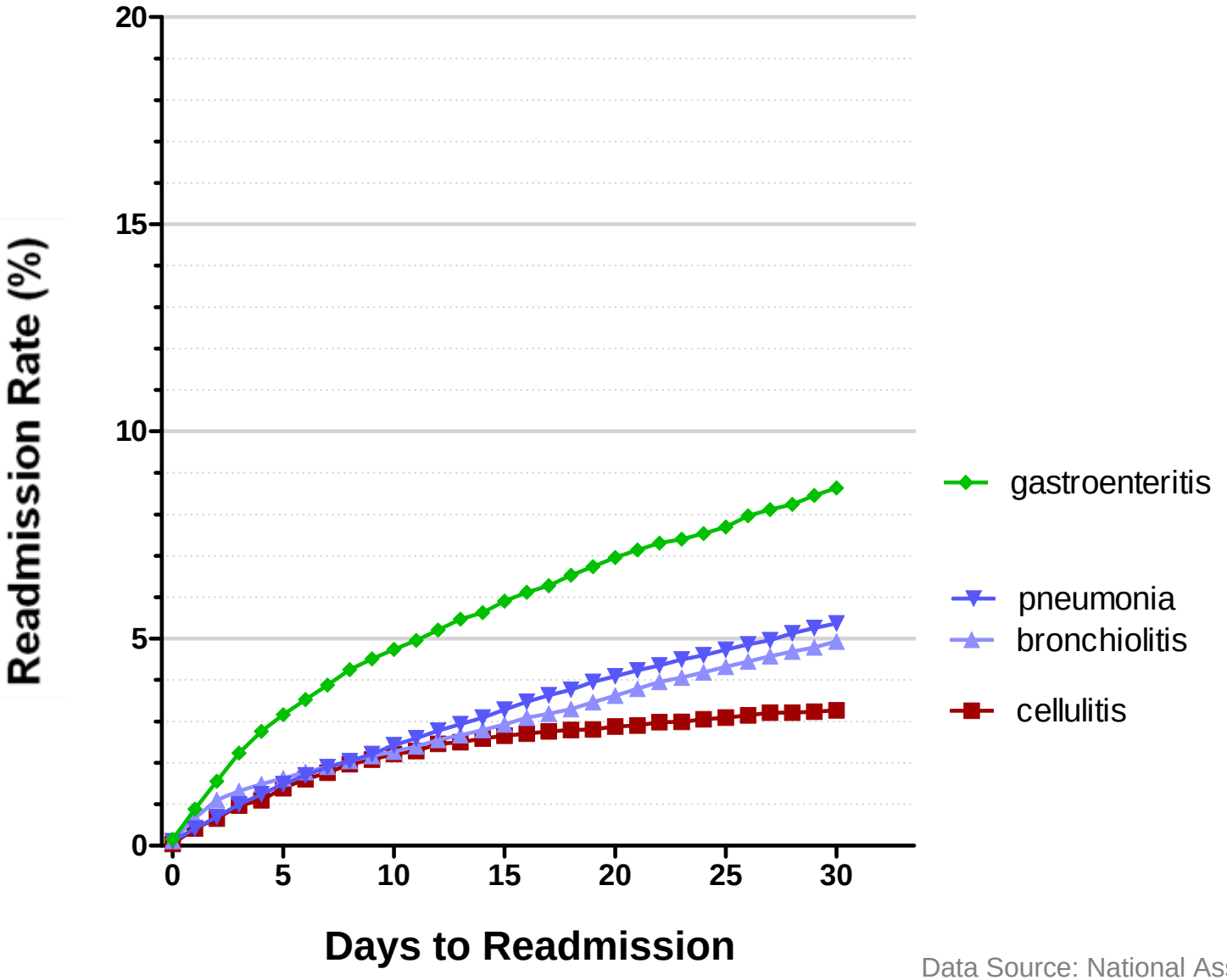

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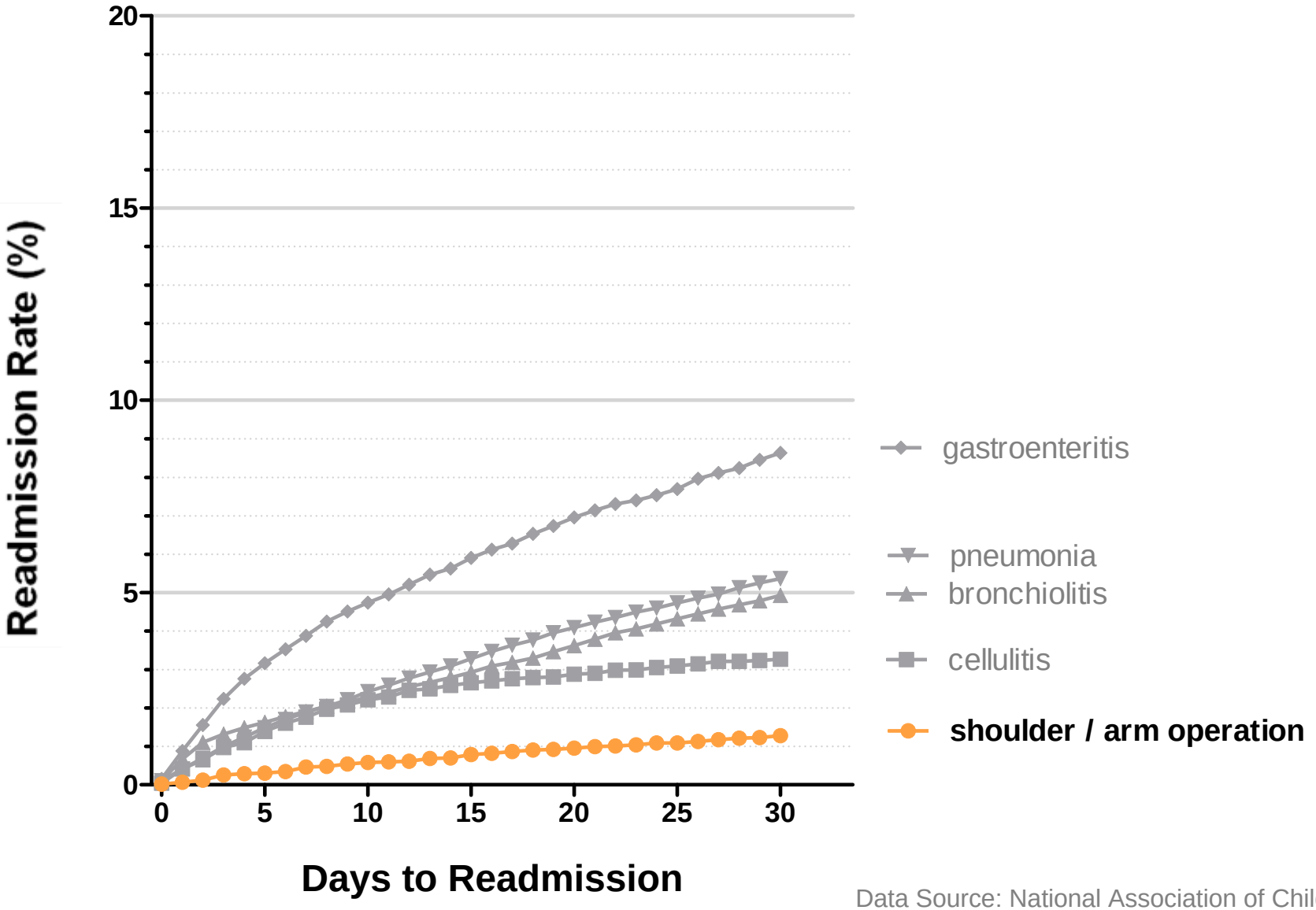

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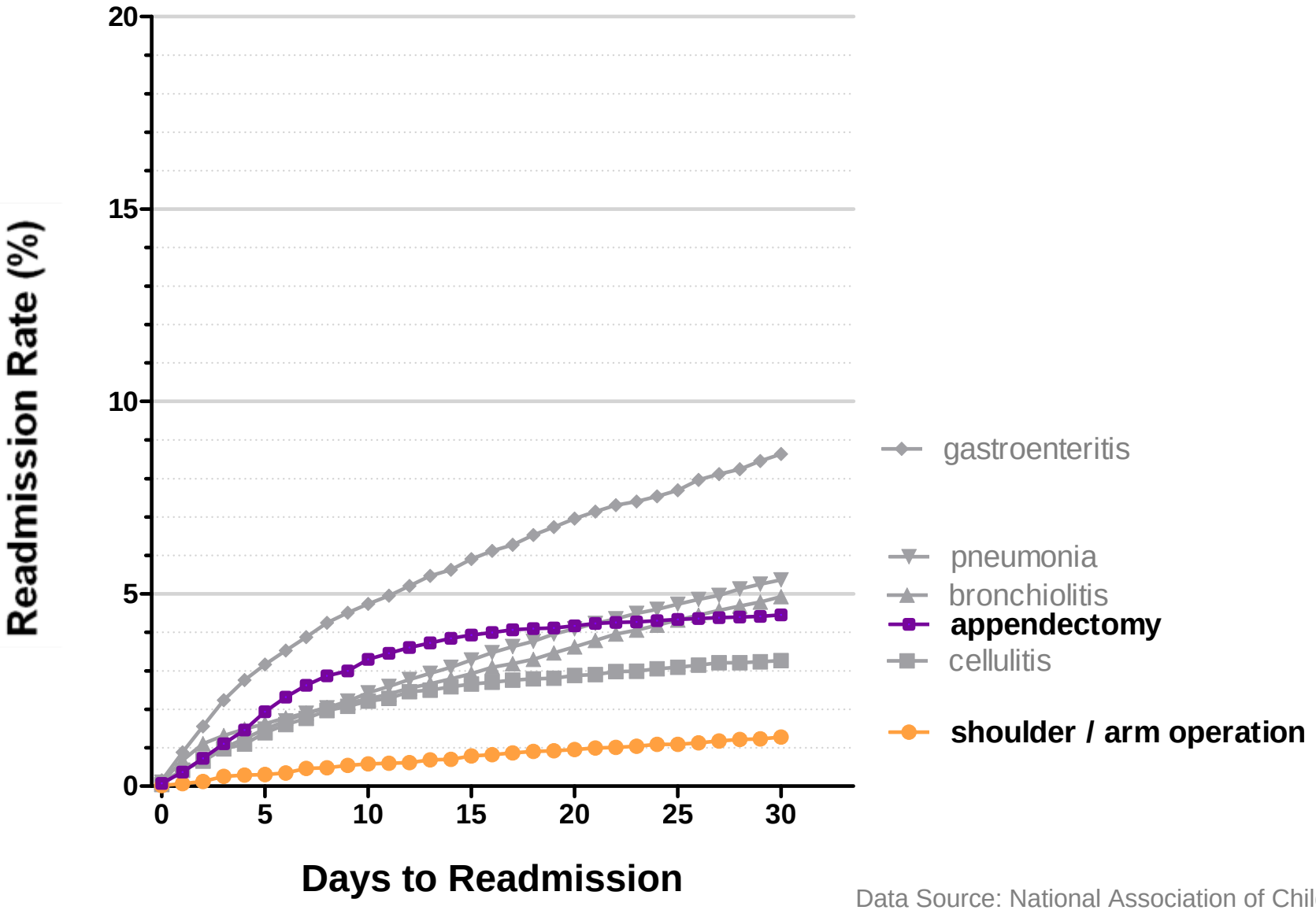

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Pediatric Acute Illness Readmission Impact

Patient Type	30 Day Readmission		
	%	N	Cost*
Pneumonia	5.4%	1605	$39.3
Gastroenteritis	8.6%	1180	$31.6
Bronchiolitis	4.9%	1613	$26.6
Appendectomy	4.5%	755	$10.3
Cellulitis	2.7%	487	$6.8

*millions (2010 dollars)

Acute Illness Readmission Prevention and Attribution

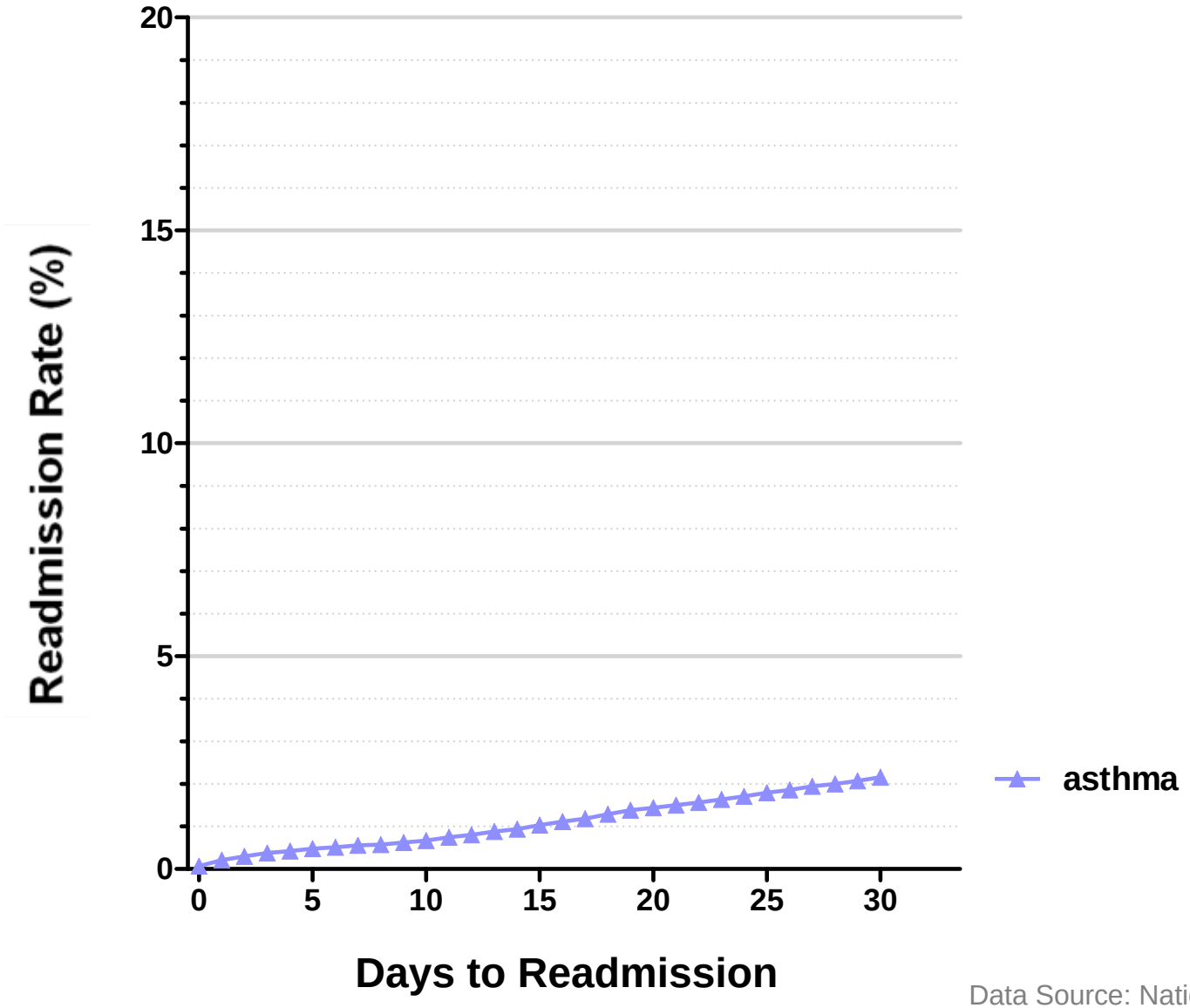
- Appendectomy and cellulitis
  - Constant readmission prevalence reached at 14 days
  - Inpatient care quality may be a major contributor

- Gastroenteritis, pneumonia, bronchiolitis
  - Readmission prevalence continuously increases
  - Further exploration of reasons for readmission

Pediatric Chronic Illness Readmissions

- Measure
  - Non-elective 30-day readmission for any reason following a chronic illness admission
    - Asthma, diabetes, seizure, sickle cell disease
    - Tonsillectomy, digestive operations, ventricular shunt operations for hydrocephalus
- Exclusions
  - Newborns
  - Oncology patients
- Data source
  - NACHRI CaseMix dataset

Pediatric Chronic Illness Readmission Rates



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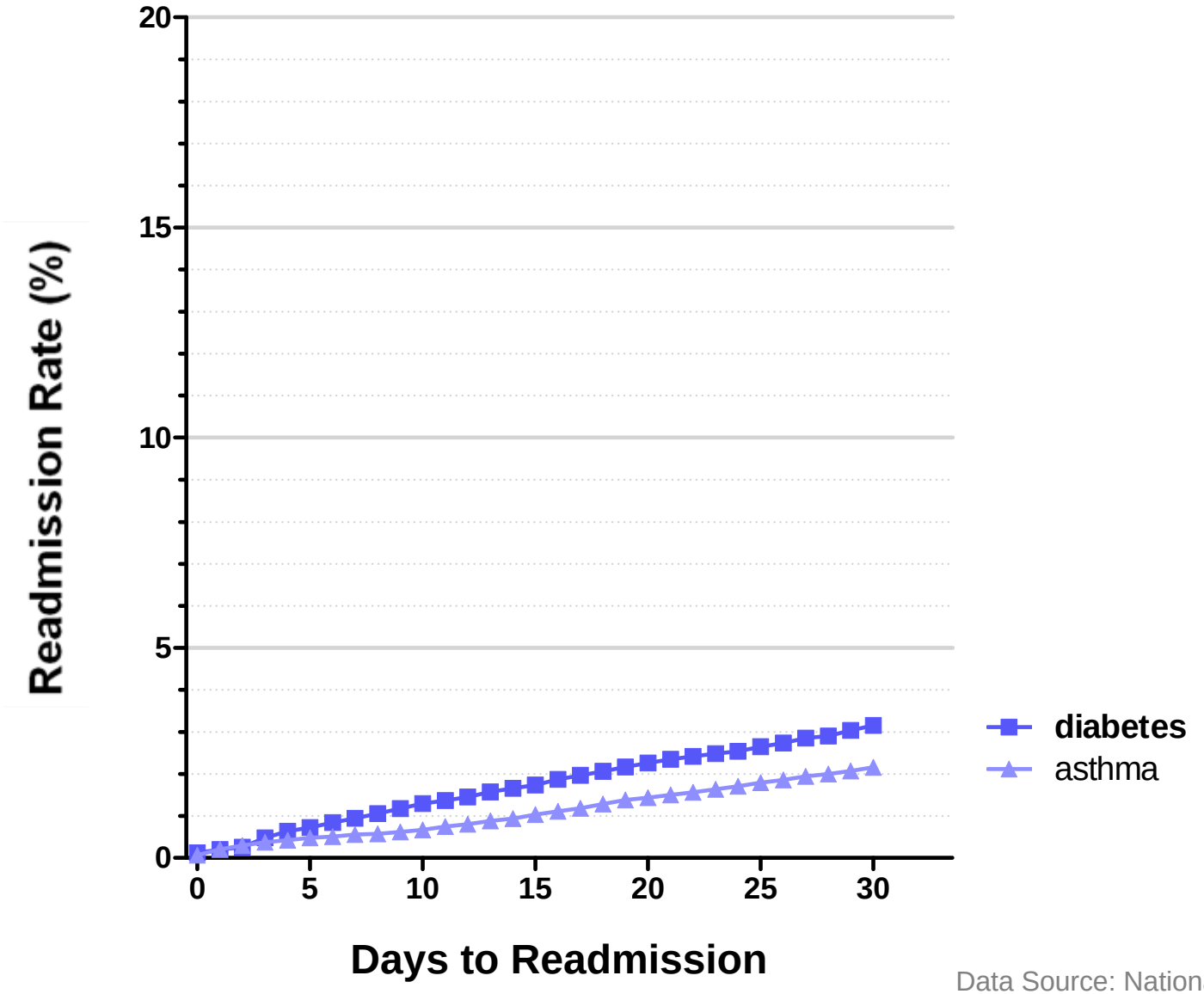

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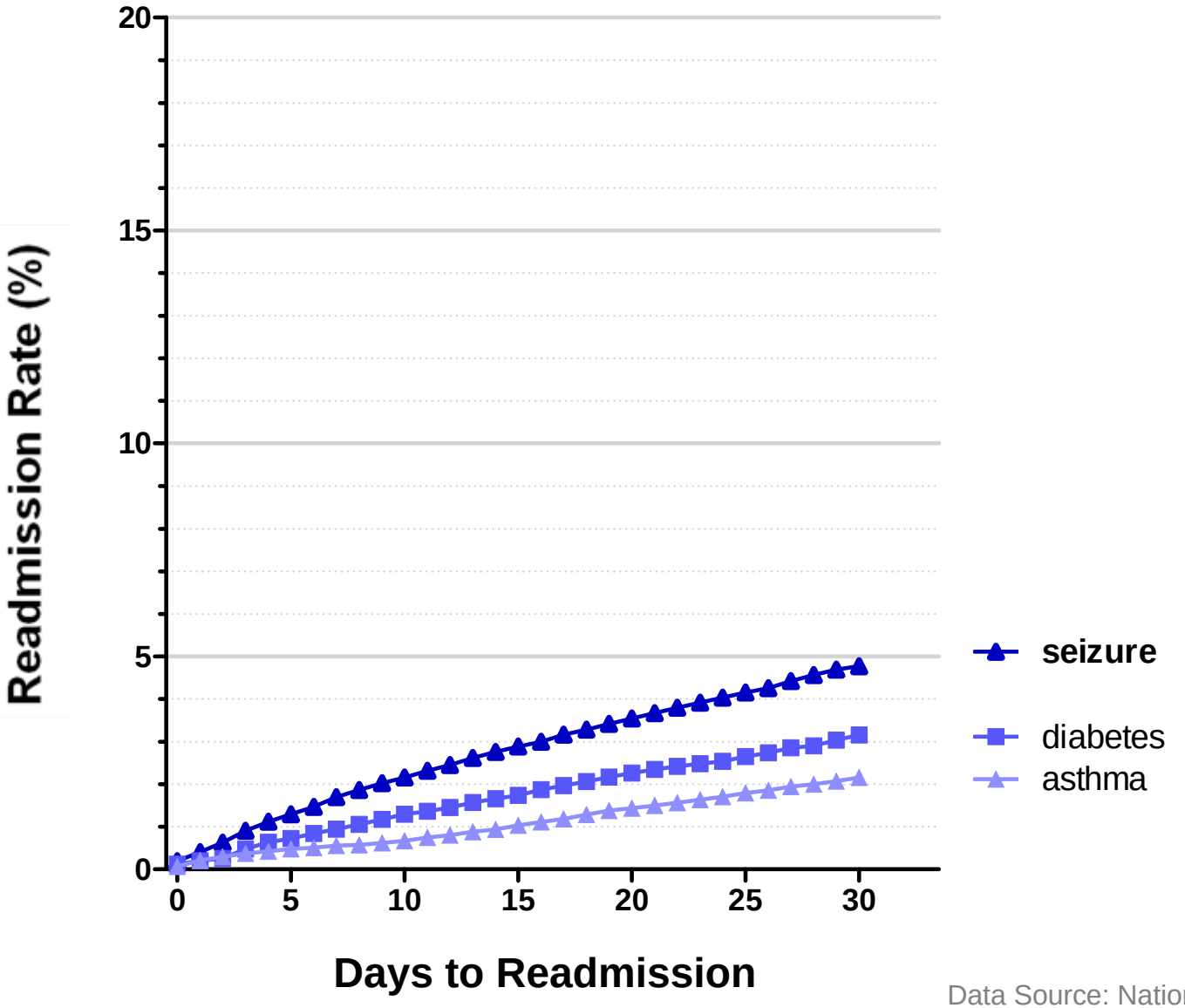

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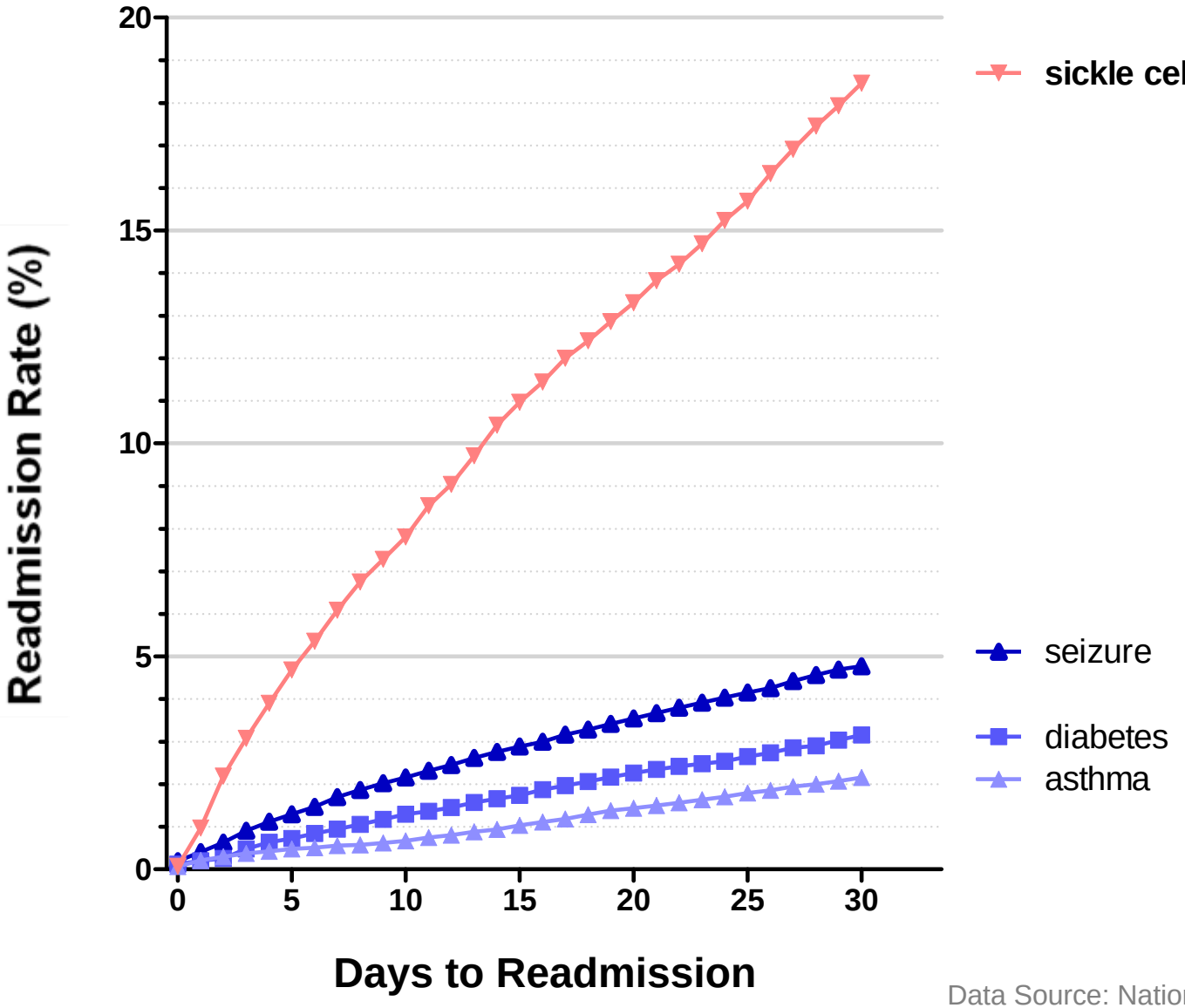

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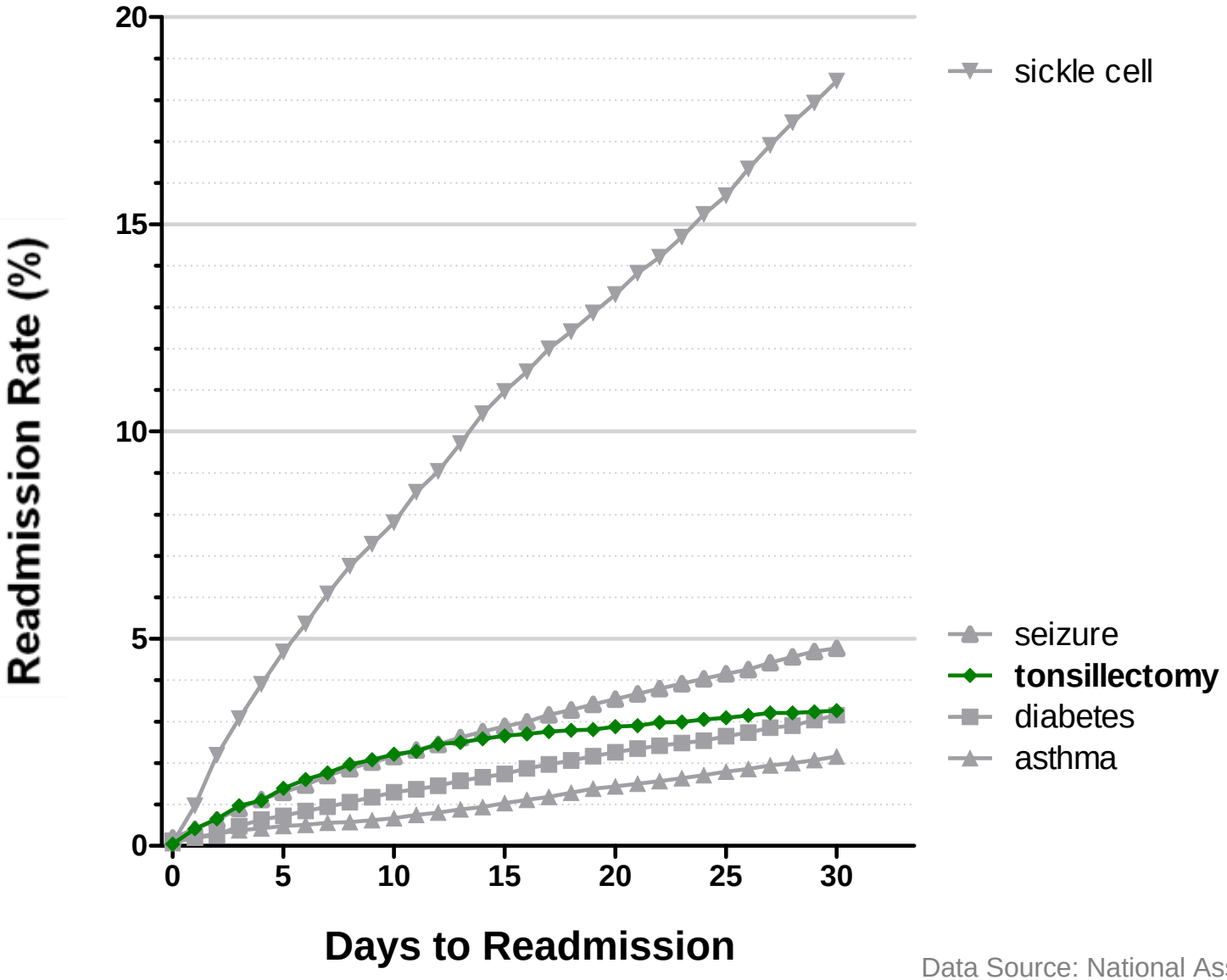

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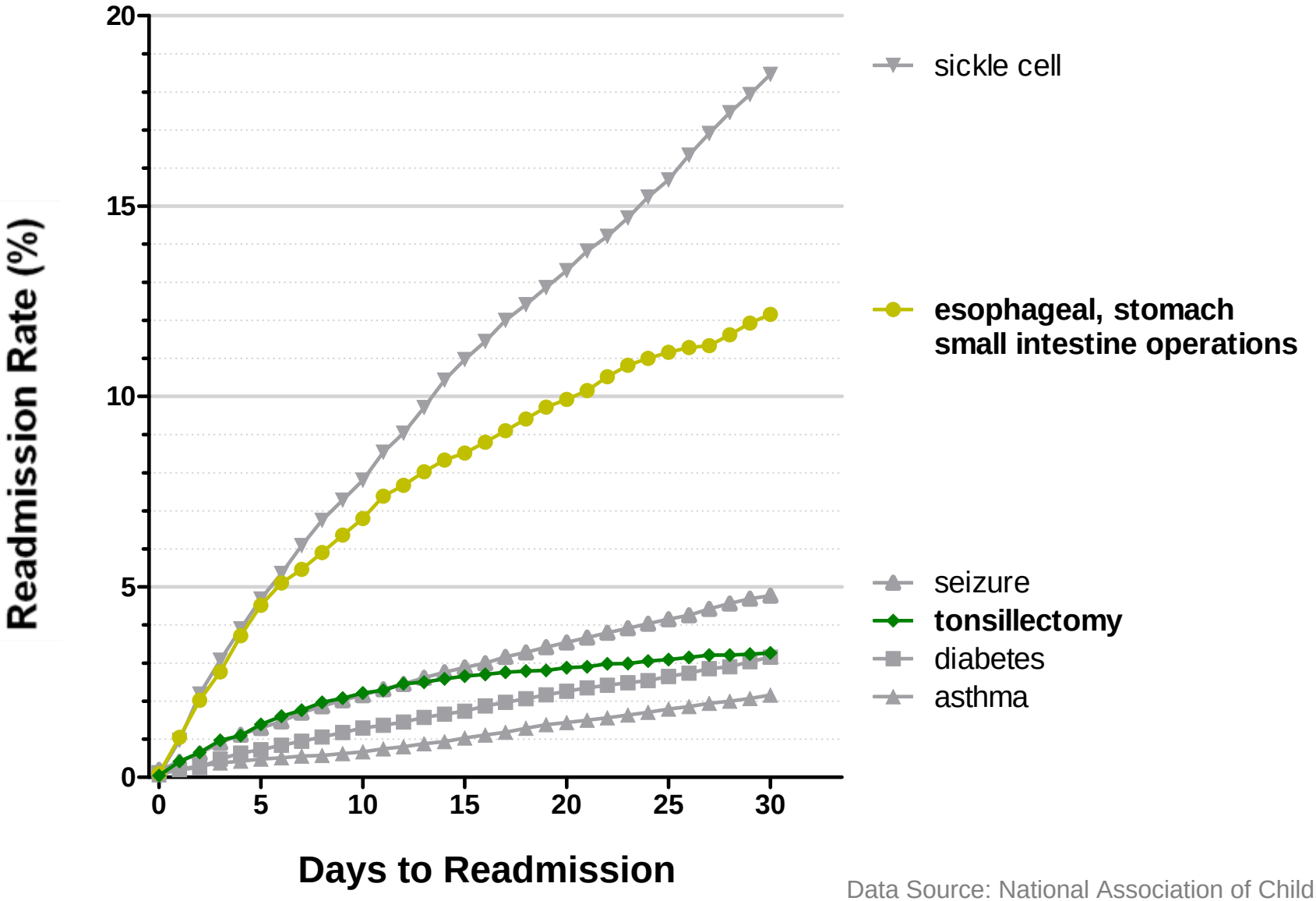

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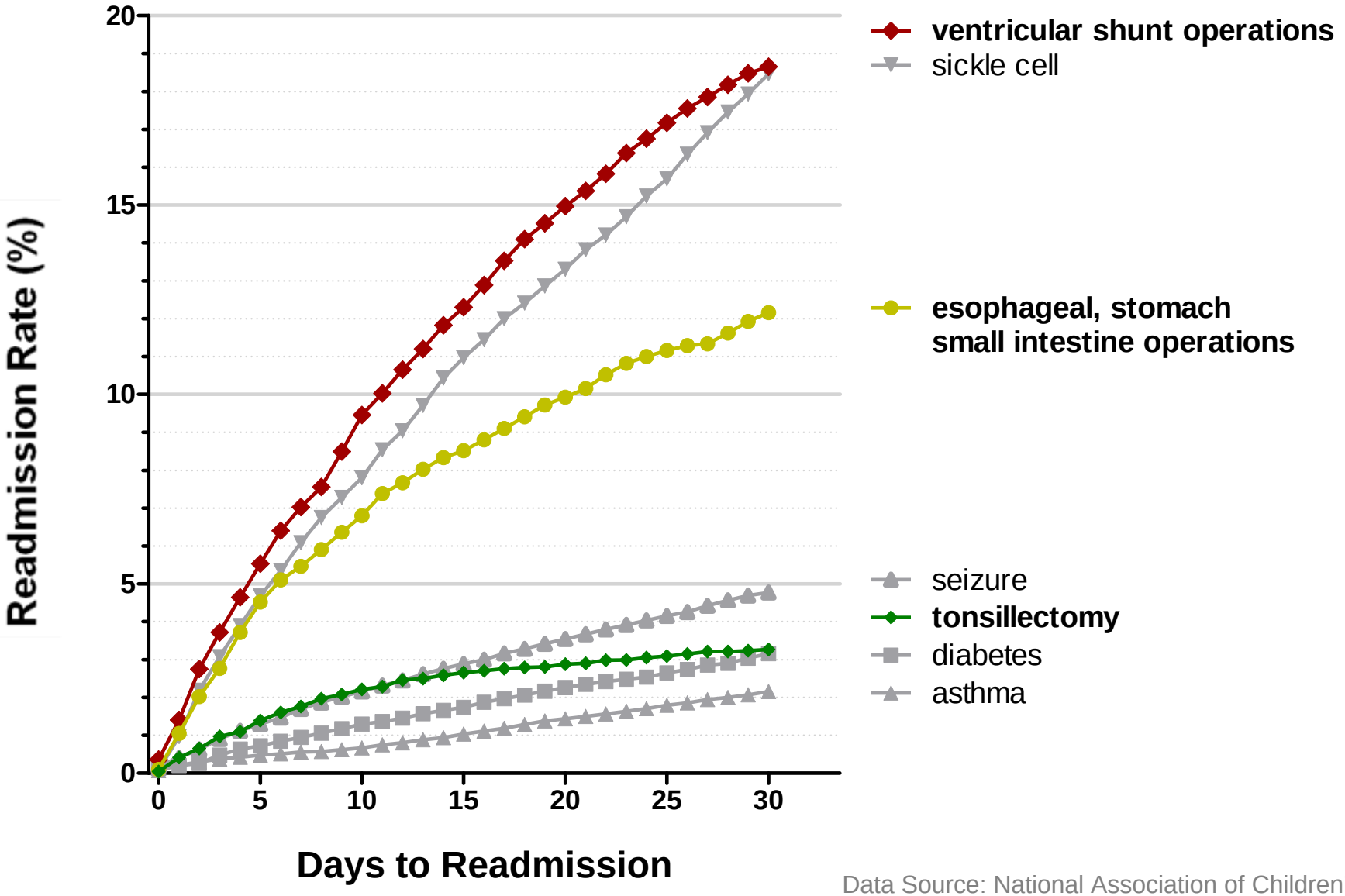

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Pediatric Chronic Illness Readmission Impact

Patient Type	30 Day Readmission		
	%	N	Cost*
Ventricular Shunt	18.6%	984	$25.1
Seizure	4.8%	1269	$22.9
Sickle Cell	18.5%	1483	$15.6
GI Operations	12.2%	474	$10.7
Asthma	2.8%	1063	$9.6

*millions (2010 dollars)

Pediatric Chronic Illness Readmission Prevention and Attribution

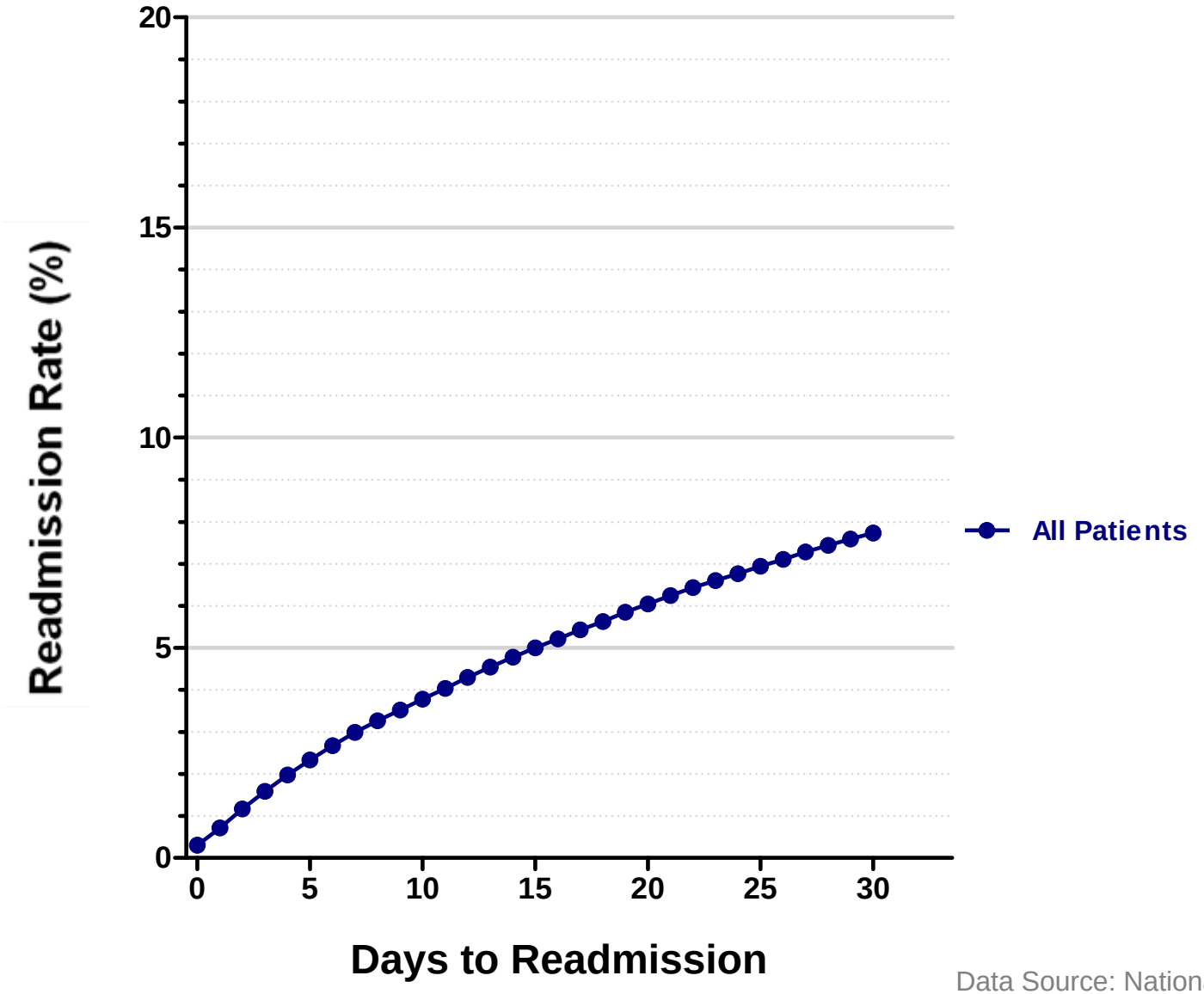
- Ventricular shunt malfunction
  - Readmission prevention with high quality surgical care
  - Limited ambulatory care prevention

- Sickle cell readmission
  - Readmission prevention with hydration and hydroxyurea
  - Ambulatory care and treatment compliance may be major contributors

All-Cause Pediatric Readmissions

- Measure
  - Non-elective 30-day readmission for any reason after any prior admission for (1) all children and (2) children with complex chronic conditions
- Exclusions
  - Newborns
  - Oncology patients
- Data Source
  - NACHRI CaseMix dataset

All-Cause 30-Day Pediatric Readmission Rates



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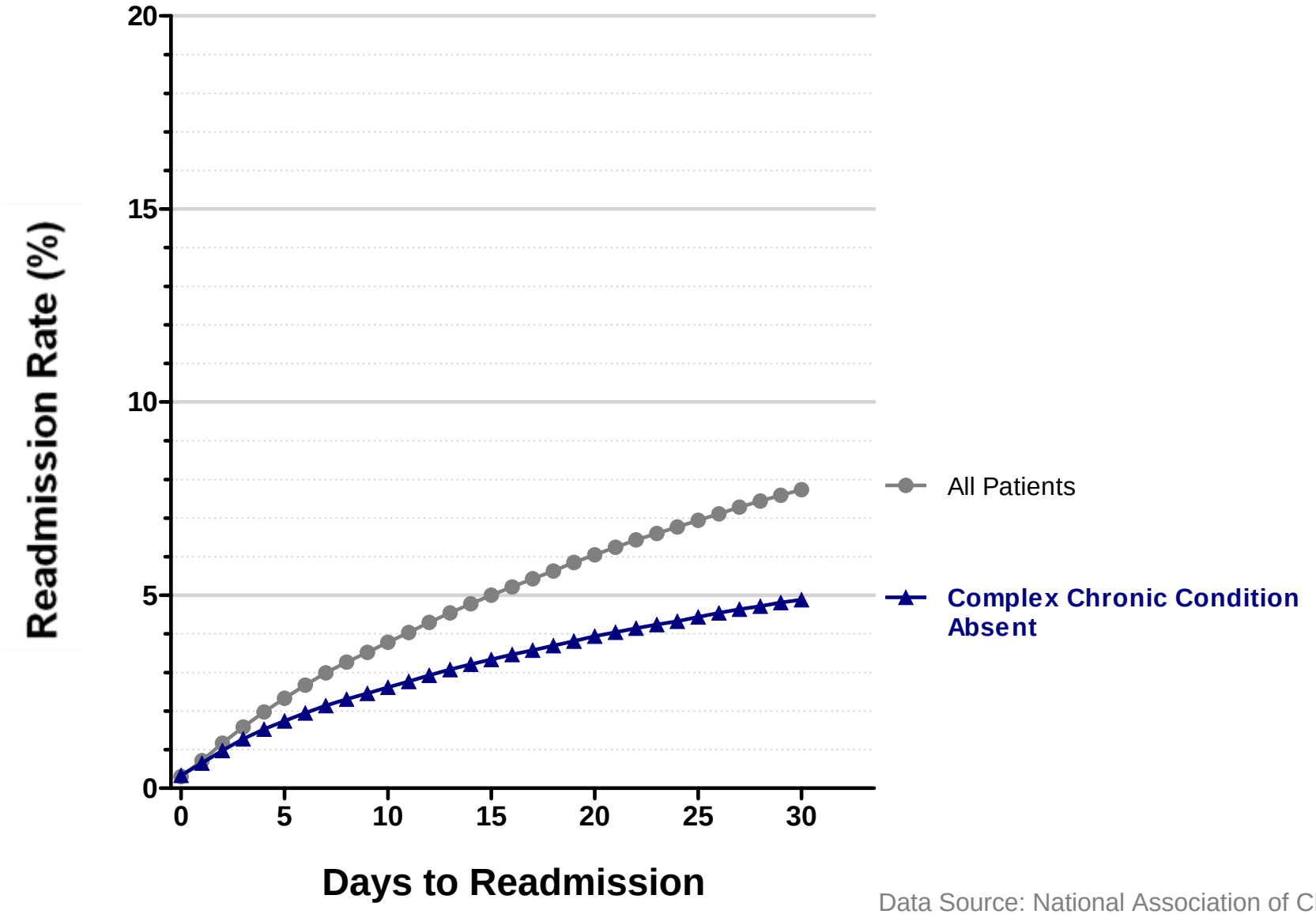

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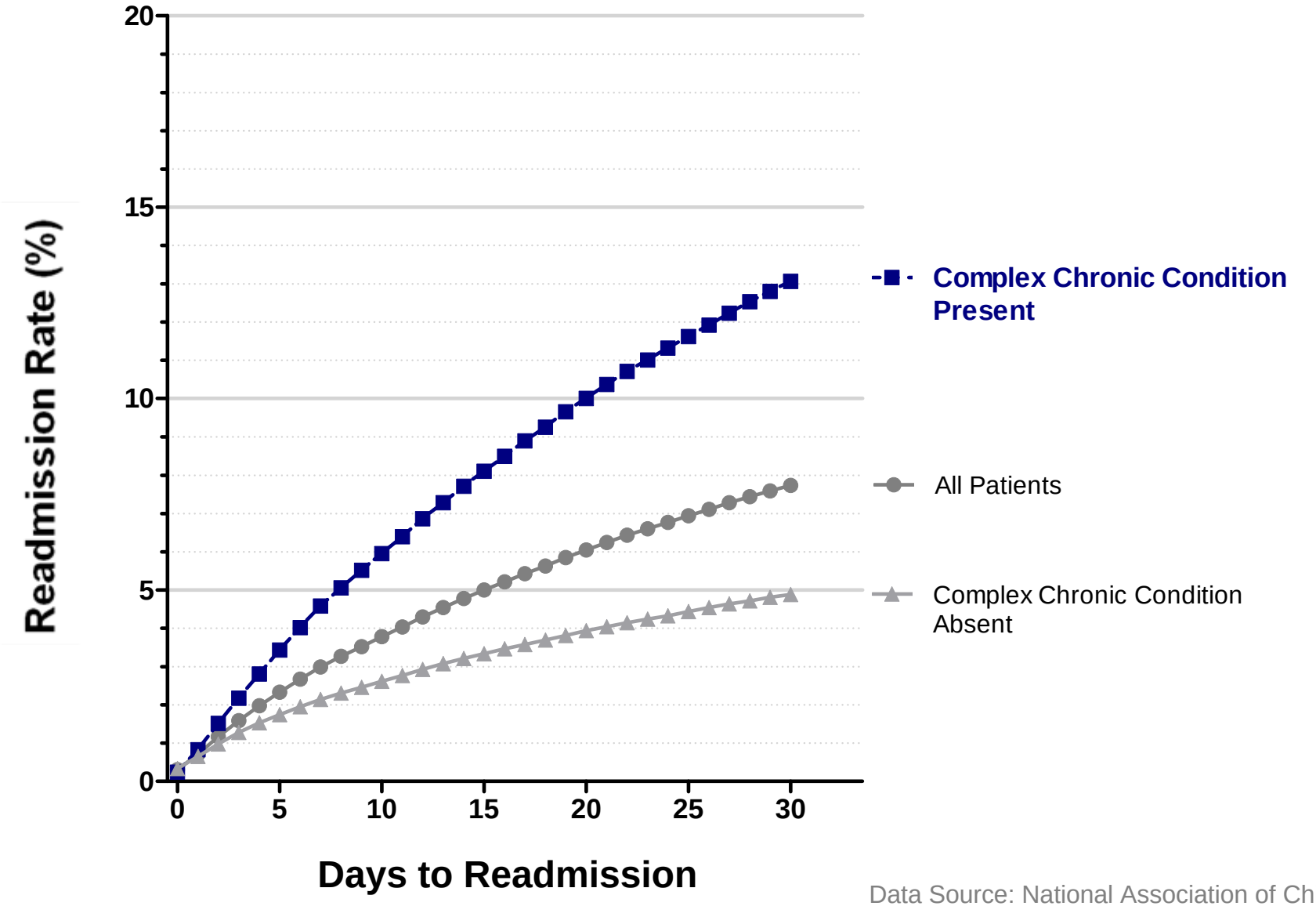

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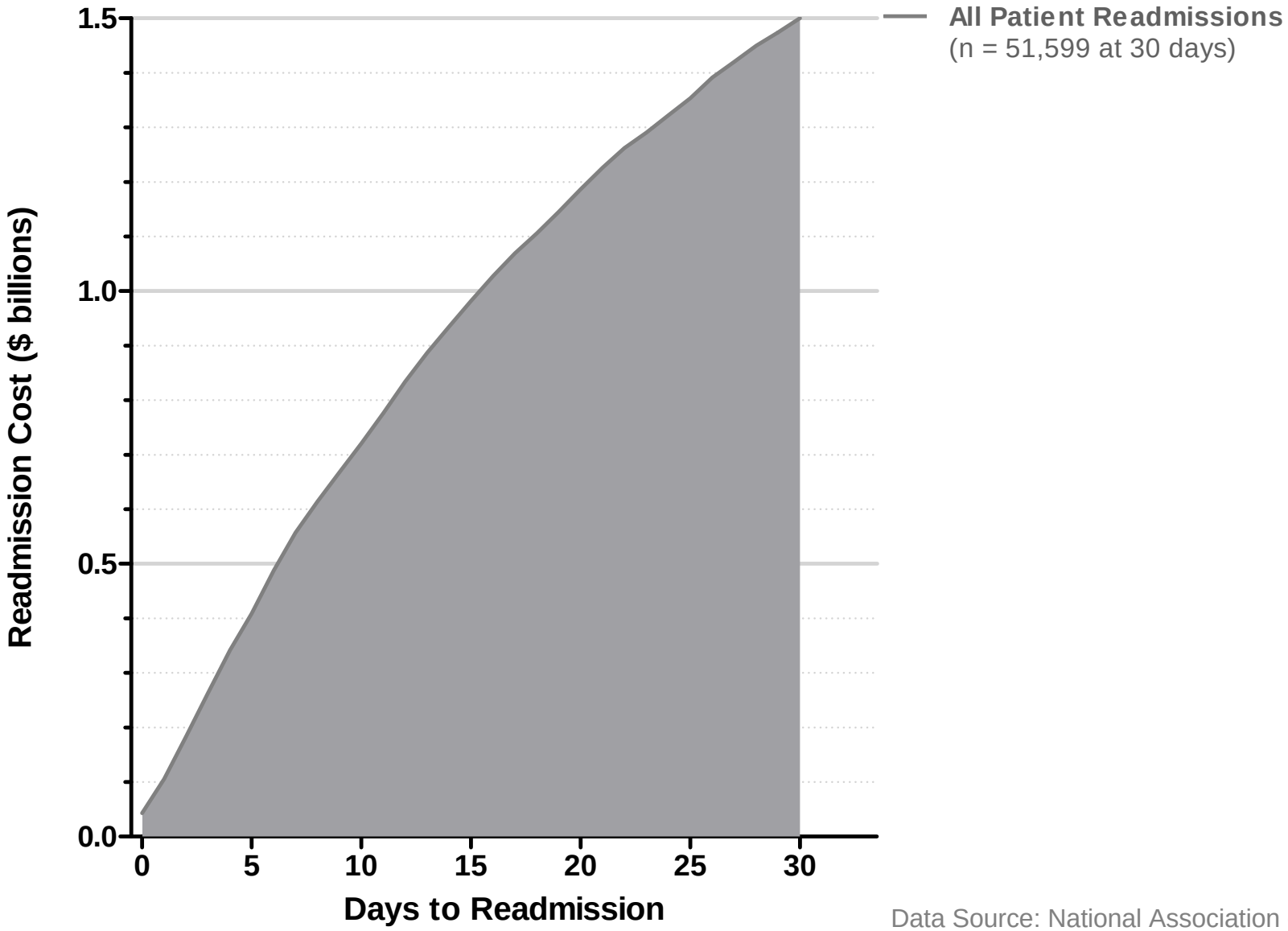
All-Cause 30-Day Pediatric Readmission Cost



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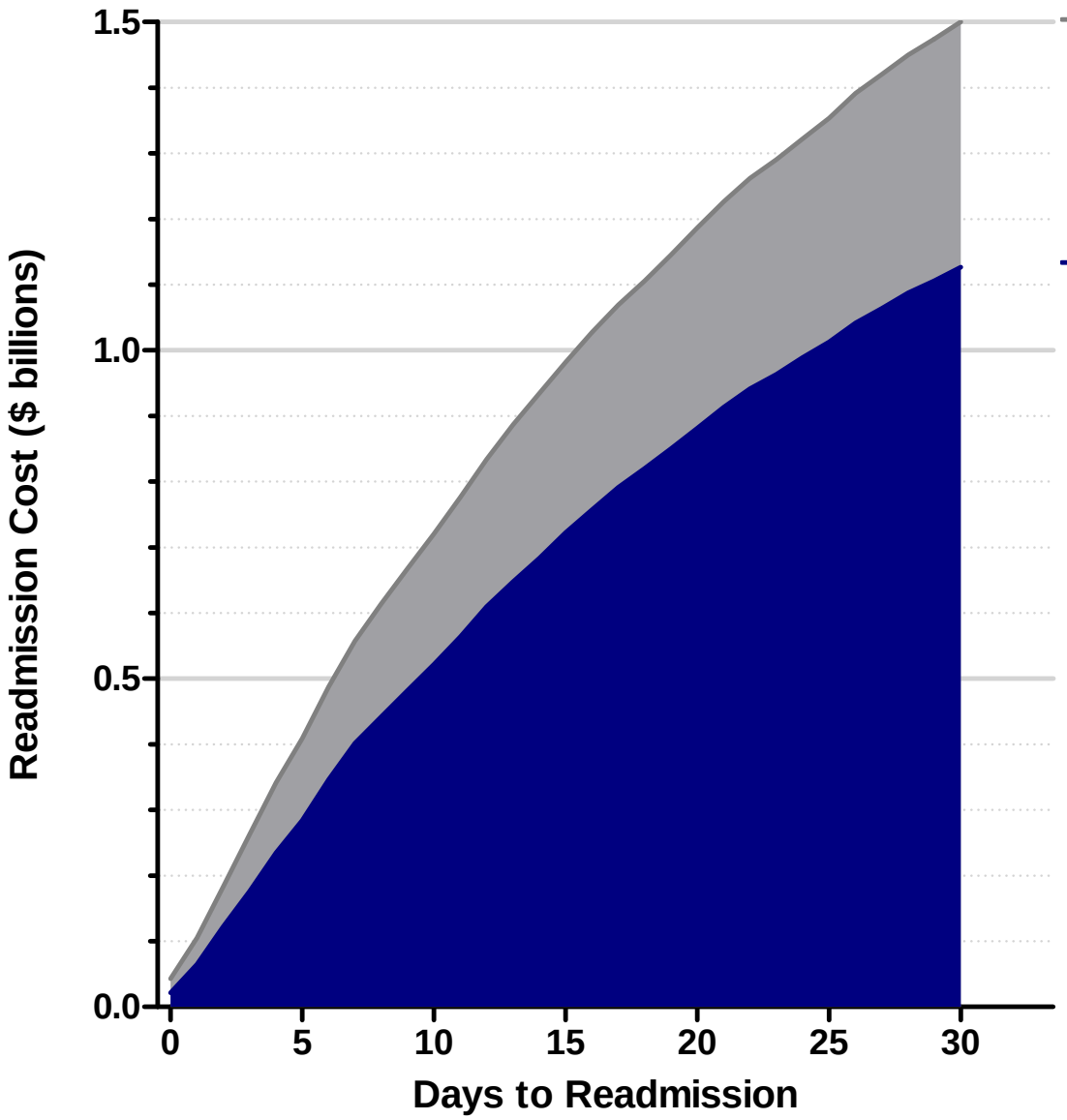
All-Cause 30-Day Pediatric Readmission Cost



All Patient Readmissions
(n = 51,599 at 30 days)

Readmissions for Children with Complex Chronic Conditions
(n =30,362 at 30 days)

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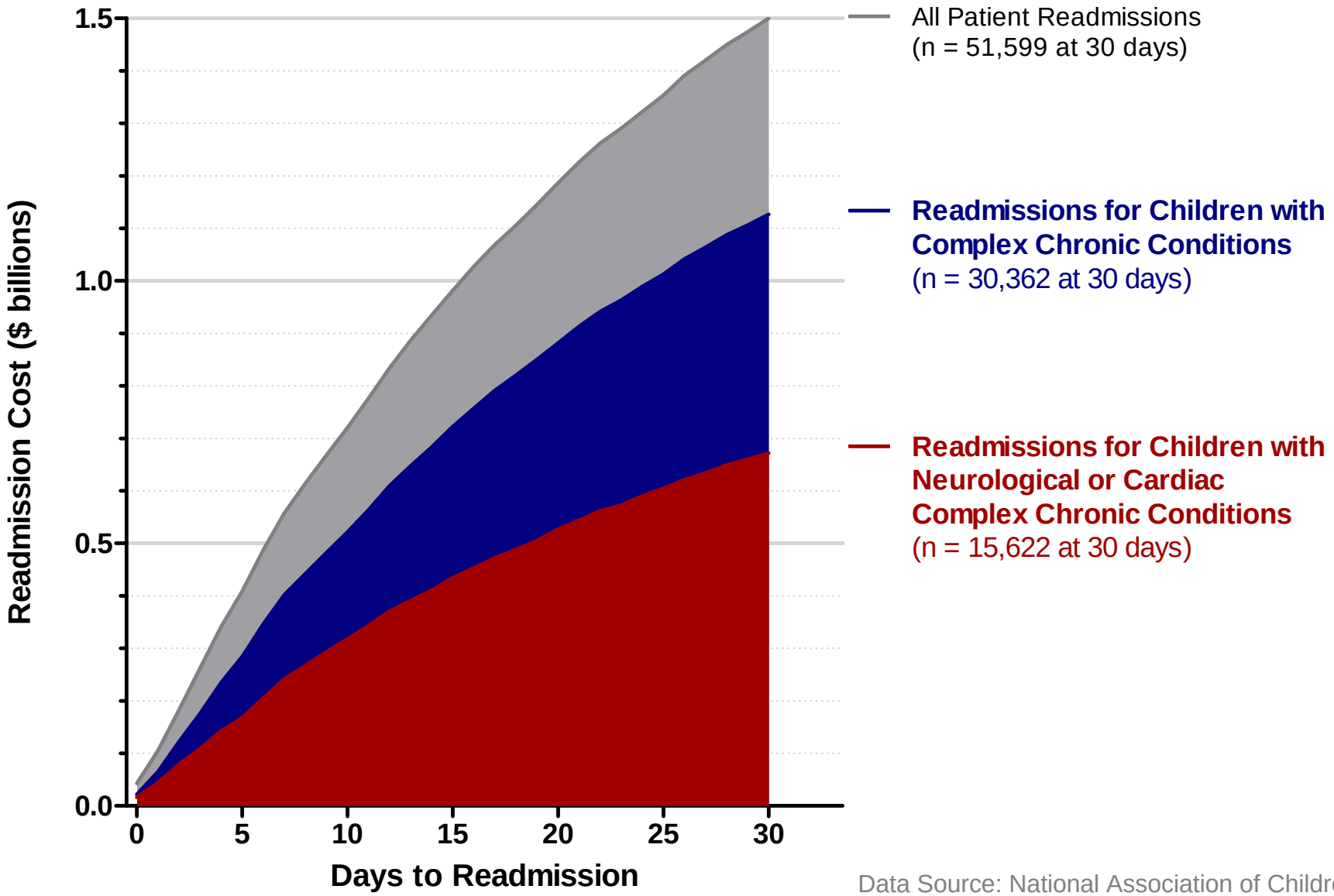
All-Cause 30-Day Pediatric Readmission Cost



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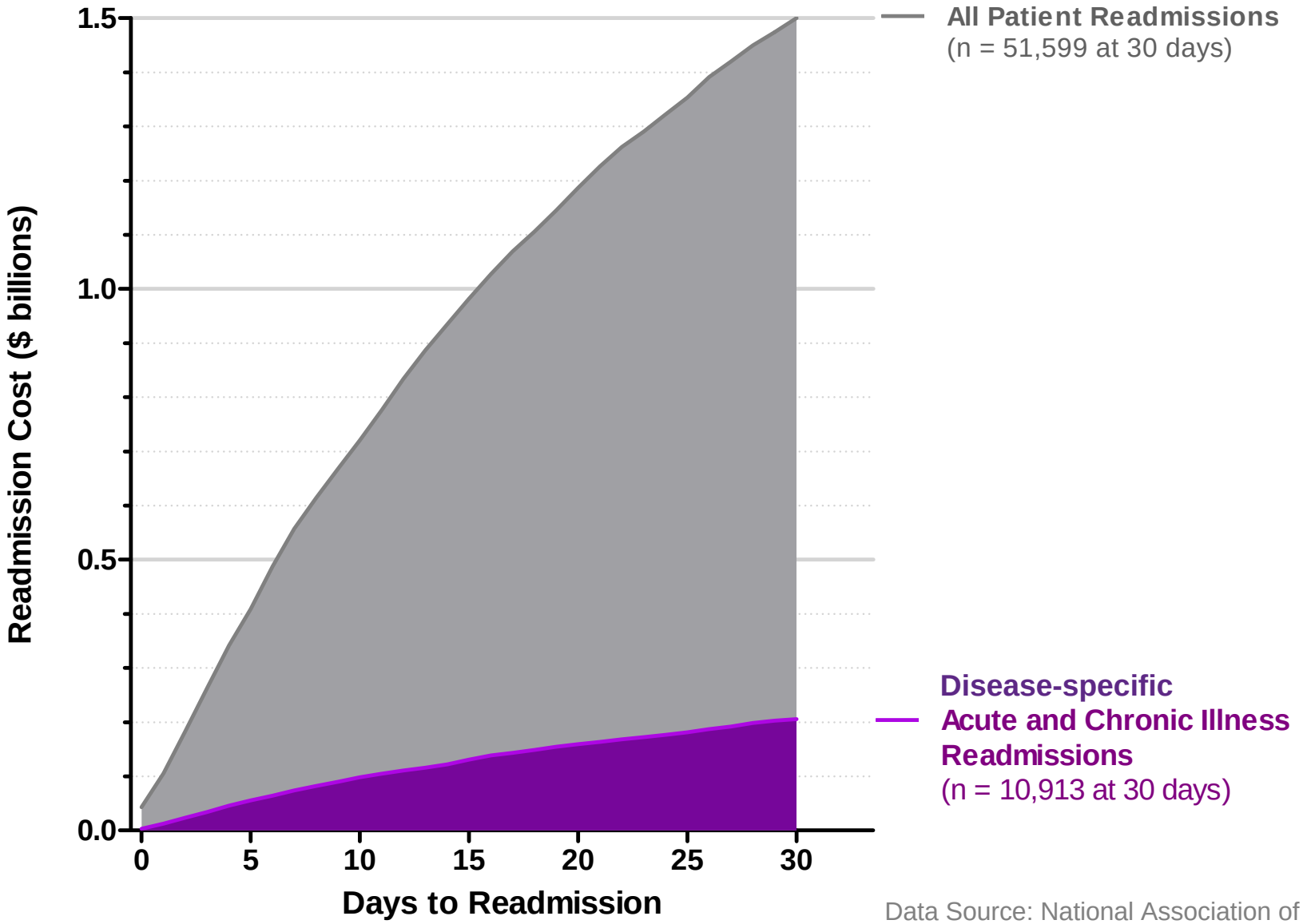

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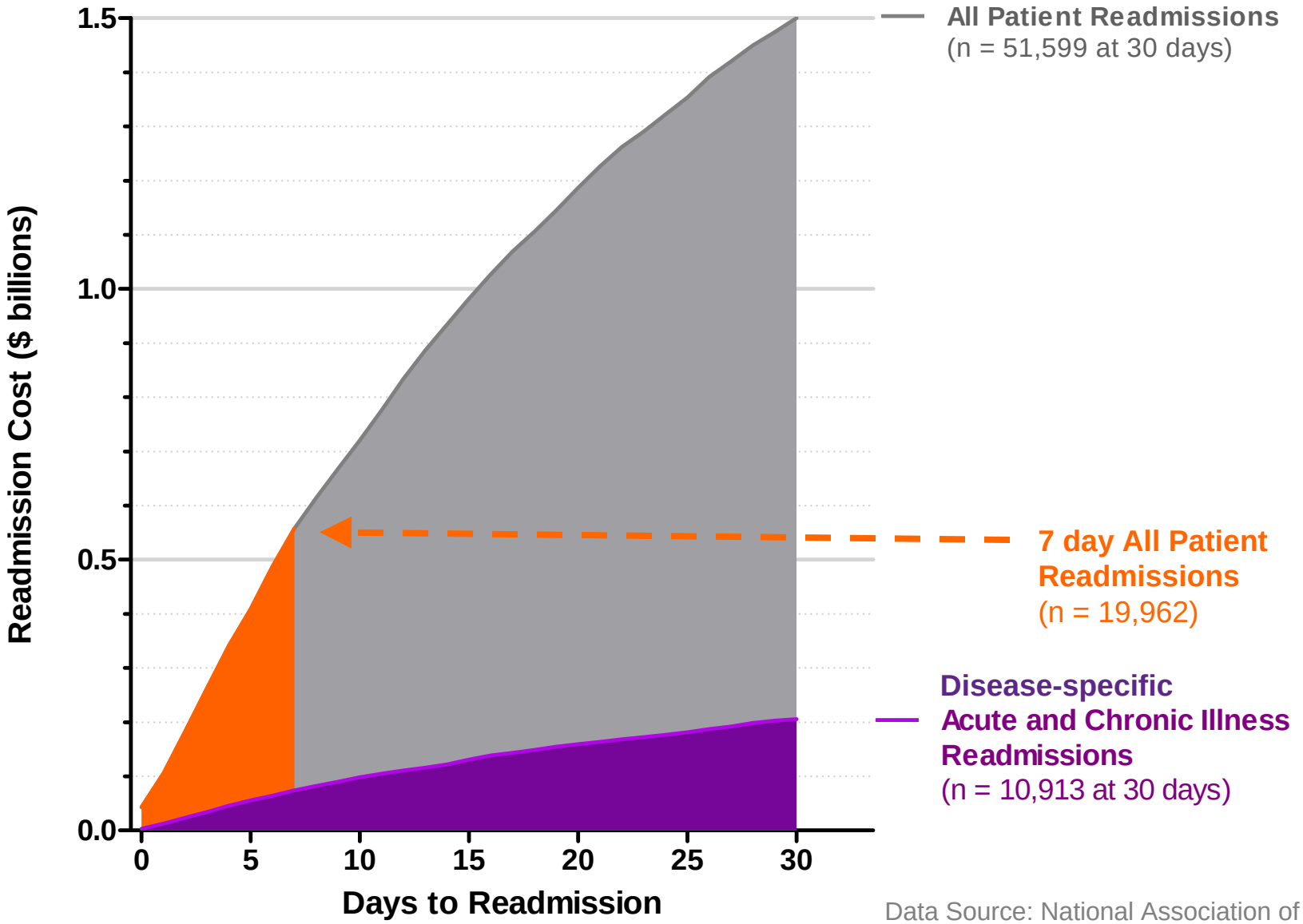

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All-Cause Pediatric Readmission Prevention and Attribution

- 7-day readmissions for all children
  - Prevented with high quality discharge care
  - Inpatient care responsibility

- 30-day readmissions for children with complex chronic conditions
  - Prevented with proactive care planning, care coordination, and ambulatory urgent care
  - Shared inpatient and outpatient responsibility

Conclusions and Future Directions

Highest Pediatric Readmission Prevalence

- 30-day readmission rates
  - Disease specific
    - Sickle cell disease (18%)
    - Ventricular shunt operations for hydrocephalus (18%)
  - All cause
    - Children with complex chronic conditions (13%)

Highest Pediatric Readmission Cost

- Newborns
  - 30-day = $200 million (national estimate)
- All-cause
  - 7-day for all children
    = $550 million (children's hospitals)
  - 30-day for children with complex chronic conditions
    = $1.1 billion (children's hospitals)

Pediatric Readmission Prevention and Attribution

- Ventricular shunt operations, tonsillectomy, appendectomy
  - Clearer reasons for readmission than non-surgical readmissions
  - Most likely related to in-hospital care
  - Limited ambulatory care readmission prevention

Limitations

- Pediatric readmission impact within children's hospitals may not be generalizeable to community hospitals who care for less children with complex chronic conditions

- Chart review and prospective methods to ascertain the reasons for readmission may be preferable to administrative data

Pediatric Readmission Future Directions

- Community hospital readmission rates
- True reasons for readmission
- Case-mix adjusted readmission rate variation
- Readmission rate disparities
- Realistic target setting with projected cost savings

Pediatric Readmissions

- Opportunity for improved care quality and cost savings

- Further development and use of meaningful and valid pediatric readmission metrics
  - Illuminate which readmissions are the most preventable
  - Inform which reduction strategies are the most effective

Acknowledgment

Vincent Chiang, MD
Ashish Jha, MD, MPH
Matt Hall, PhD
Mark Schuster, MD, PhD
Shanna Shulman, PhD
Sara Toomey, MD, MPH
Alan Zaslavsky, PhD

Agency for Healthcare Research and Quality (U18-Schuster)
National Institute for Child Health and Human Development (K23-Berry)

Thank you!