Title: Toward standardizing the identification of emergency department visits in administrative data: a comparison of operational definitions using Medicare claims

Short Running Title: Examining ED Visit Definitions in Administrative Claims

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Abstract:

Objectives

Administrative claims datasets are often used for emergency care research and policy investigations of healthcare resource utilization, acute care practices, and evaluation of quality improvement interventions. Despite the high profile of emergency department (ED) visits in analyses using administrative claims, little work has evaluated the degree to which existing definitions based on claims data accurately captures conventionally defined hospital-based ED services. We sought to construct an operational definition for ED visitation using a comprehensive Medicare dataset and to compare this definition to existing operational definitions used by researchers and policymakers.

Methods

We examined four operational definitions of an ED visit commonly used by researchers and policymakers using a 20% sample of the 2012 Medicare Chronic Condition Warehouse (CCW) dataset.[1] The CCW dataset included all Part A (hospital) and Part B (hospital outpatient, physician) claims for a nationally representative sample of continuously enrolled Medicare fee-for services beneficiaries. Three definitions were based on published research or existing quality metrics including: 1) provider claims based definition, 2) facility claims based definition and 3) CMS Research Data Assistance Center (ResDAC) definition. In addition, we developed a fourth operational definition (Yale definition) that sought to incorporate additional coding rules for identifying ED visits. We report levels of agreement and disagreement among the four definitions.

Results

Of 10,717,786 beneficiaries included in the sample dataset, 22% had evidence of ED use during the study year under any of the ED visit definitions. The definition using provider claims identified a total of

4,199,148 ED visits, the facility definition 4,795,057 visits, the ResDac definition 5,278,980 ED visits and the Yale definition 5,192,235 ED visits. The Yale definition identified a statistically different ($p<0.05$) collection of ED visits than all other definitions including 17% more ED visits than the provider definition and 2% fewer visits than the ResDac defintion. Differences in ED visitation counts between each definition occurred for several reasons including the inclusion of critical care or observation services in the ED, discrepancies between facility and provider billing regulations, and operational decisions of each definition.

Conclusion

Current operational definitions of ED visitation using administrative claims produce different estimates of ED visitation based on the underlying assumptions applied to billing data and dataset availability. Future analyses using administrative claims data should seek to validate specific definitions and inform the development of a consistent, consensus ED visitation definitions to standardize research reporting and the interpretation of policy interventions.

Introduction:

Administrative claims datasets are often used by emergency care researchers and policymakers to define cohorts of patients for acute care research, and more commonly, such datasets are used outside of emergency medicine to define emergency department (ED) visits as an outcome for studies of healthcare resource utilization or evaluation of quality improvement interventions such as care coordination.[2-6] Despite the high profile of ED visits in analyses using administrative claims, little work has sought to rigorously compare the degree to which estimates based on data created for billing purposes differ in describing the clinical construct of an ED visit in which a patient seeks acute, unscheduled care for undifferentiated clinical scenarios at a hospital-based emergency department.[7] Previous publications and technical reports have often suggested definitions for an ED visit specific to the limitations of certain datasets with little supporting analyses to provide reassurance to clinicians or policymakers charged with interpreting research findings.[8,9] As a result, variations in the definition of ED visitation may overcount ED visits by capturing non-hospital services or undercount ED visits by failing to capture ED visits co-occurring with critical care or observation.

Administrative claims of Medicare beneficiaries are the most frequently used dataset for researchers as well as policymakers. An unstructured search of publications in the past ten years revealed over 135 publications using Medicare data and over 1500 publications using administrative claims data with mention of the "emergency department." Similarly, ED visits are defined in the cohort

or outcomes of 29 quality measures endorsed by the National Quality Forum that use administrative claims data. Given federal efforts at data transparency[10], statistics derived from Medicare administrative claims data are also used by public and private organizations seeking to advance policy agendas. Furthermore, recent consensus statements have also supported the increased use of administrative claims data for research in emergency care.[11] However, complicating these efforts has been the consistency in how ED visits are operationally defined.

Therefore, we sought to compare 4 operational definitions for ED visitation using a comprehensive Medicare dataset. We contrasted three established operational definitions used by policymakers and researchers with one we constructed based on emergency care expert opinion and clinician review that utilized all relevant data sources.

Methods:

Design and Dataset: We used a 20% random sample of the Medicare Chronic Condition Data Warehouse (CCW) dataset.[1] CMS draws the sample for the dataset from all Medicare fee-for-service beneficiaries. This dataset includes all Medicare claims for each included beneficiary between January 2012 and December 2012. The dataset has undergone substantial "cleaning" to ensure that only final, adjudicated claims are included to increase reliability. The Medicare CCW dataset is an ideal data source for this study because all Medicare Part A (inpatient hospital and skilled nursing) and Part B (hospital outpatient and physician) services are captured in the dataset for each included beneficiary.

Definitions: For this analysis we compared 4 operational definitions of an ED visit. Three established definitions were identified based on a review of the peer-reviewed literature, federal government authored research reports and technical guidance available for national quality measures. One definition, the Yale definition, was developed to utilize these established definitions and additional expert review. All definitions are intended to identify hospital-based ED visits, consistent with the Institute of Medicine's conceptual focus on hospital-based emergency care[7] that is the current focus of most existing health services research and quality measures:

1) *Provider definition*: several researchers have used physician service, or "carrier," claims to identify ED visits. Provider defined ED visits are those with Part B claims for Healthcare Common Procedure Coding System (HCPCS) codes 99281, 99282, 99283, 99284 and 99285.[12-15]
2) *Facility definition*: hospital inpatient and outpatient facility claims are commonly used by researchers and by CMS to define ED visits.[16,17] For this definition, we considered an ED visit presence of ED revenue center codes 0450-0459, 0981 in the hospital outpatient department or hospital inpatient department claims.

3) *ResDac definition*: The CMS Research Data Assistance Center (ResDac) publishes guidance for researchers using Medicare administrative claims data. The most recent definition, published in July 2015, defines an ED visits as a hospital outpatient or inpatient claims with revenue center codes 0450-0459, 0981 or a hospital inpatient claim with an emergency room charge > $0.[9,18]
4) *Yale definition*: Based on expert consensus and clinician review, we applied several modifications to existing definitions to construct a new operational definition for ED visits using administrative claims that reflects the current organization and delivery of acute care; we describe this approach below and in **Figure 1**.

Approach to development of the Yale operational definition for ED visitation

To develop our Yale operational definition of an ED visit we first sought to capture all possible healthcare service use that could represent an ED visit. To do this we first included all physician service claims used for ED services (HCPCS 99281, 99282, 99283, 99284, 99285, 99291)[19] and all hospital outpatient and inpatient claims that indicated use of ED services based on revenue center codes (0450-0459, 0981). As many claims included numerous "claim lines" for distinct healthcare services over broad ranges of time, we consider each individual claim line as a possible visit for this analysis.

For analyses of all definitions we first excluded all duplicate claims likely to reflect billing errors. To exclude duplicate facility claims, we considered hospital outpatient or inpatient facility claims conducted at the same hospital (defined by Medicare provider number) and by the same physician (defined by NPI number) on the same date without use of coding modifier 25 or 27, which indicate unique same-day ED visits, to be duplicate claims. To exclude duplicate provider claims, we considered all provider claims with identical ED location (based on hospital Medicare provider number), identical ED clinician (based on NPI number) and identical date of service to be duplicate claims.

Given that most ED visits include the creation of both a facility claim (hospital outpatient or hospital inpatient) as well as a provider claim we also sought to identify any overlapping claims reflecting the same ED visit. Currently, Medicare regulations for hospital facility care pay for ED services as "bundled" within the single Diagnosis Related Group (DRG) payment set by the Inpatient Prospective Payment System for admitted patients or as an Ambulatory Payment Classification (APC) set by the Outpatient Prospective Payment System for patients not admitted to inpatient status. At the same time, Medicare pays for provider services in the ED based on HCPCS codes billed to Medicare separately by the provider. To avoid duplicate counting of overlapping claims, we first assumed that each provider claim was likely to represent a unique ED visit because billing guidelines for hospital outpatient visits carry greater ambiguity than provider claims with regards to the definition of emergency services.[20]

While one previous study similarly sought to combine facility and provider claims to define ED visitation, our approach allows for repeat ED visitation within 72 hours which have been shown to be common and were excluded by prior work.[21-23] We therefore considered any hospital inpatient or outpatient claim for an ED visit on the same day, previous day or following calendar day as an overlapping visit that should not be counted as a unique ED encounter. **Table 2.** Additionally, because providers or facilities claims may often include multiple ED visits on the same claim as a result of the claim adjudication and reporting processes, the number of ED visits captured by each definition can exceed the total number of claims.

To select only those claims likely to represent traditional ED care involving care by a physician or mid-level provider in a hospital-based emergency department open 24 hours a day 7 days a week, we identified several clinical scenarios for further exclusion or inclusion:

1) Use of critical care services outside the ED: As the acuity of patients evaluated in the ED has increased over the past decade, the billing of critical care services (HCPCS 99291) in the ED has also risen.[24,25] Because current Medicare Part B guidelines do not allow for the duplicative billing of Critical Care Services and Evaluation and Management Services (HCPCS 99281-99285) in the ED, we excluded all provider claims for HCPCS 99291 in which the place of service was not the Emergency Department.
2) Non-ED setting claims: We identified several types of professional provider claims and facility claims that may occur outside the ED setting but billed with similar codes such as services provided in physician offices, urgent care, nursing facilities and at home. Current provider and facility claims include "place of service" designations that differentiate between these settings and the ED.[26] While these codes are not sensitive, they are quite specific; therefore, we excluded any provider claims with place of service outside the emergency department (place of service = 23). Supplementary Table 1.
3) Observation admissions: The majority of observation services are provided by ED managed observation units and current Part B payment regulation do not allow for physicians of the same Tax Identification Number (TIN) or medical specialty to provide evaluation and management services for both an ED visit and admission to observation.[27-29] Therefore use of ED provider claims may not capture all ED visits resulting in observation. We defined any visit resulting in hospital observation service use (Outpatient revenue center 0762 or outpatient revenue center 0760 and HCPCS G0378) in which a hospital revenue center code for ED services is also present (0450-0459, 0981) as evidence of an ED visit.[30,31]

While these clinical scenarios are not currently specified within existing operational definitions, ED visits captured or excluded by these scenarios are variably captured by each existing provider, facility and ResDac operational definitions based solely on select billing criteria.

Analysis: We present descriptive statistics for each definition and compare our novel definition of an ED visit to existing definitions using 2x2 tables of agreement. We report McNemar's test to assess statistical agreement between our definition and each operational definition. To account for multiple statistical comparisons we utilize the conservative Bonferroni correction with subsequent alpha = 0.0125. As a secondary analysis, we also tested the sensitivity of the Yale definition to provider claim date of service accuracy by re-creating each 2x2 table of agreement assuming that a provider claim +/- 2 days or +/- 3 days from a facility claim represented a matched ED visits.

Results:

A total of 10,717,786 beneficiaries were included in the 2012 Medicare Chronic Condition Warehouse 20% sample dataset representing care for over 50 million Medicare fee-for-service beneficiaries across the US. A description of the sample is seen in **Table 1**. A total of 2,356,226 beneficiaries (22%) had any evidence of emergency department use during the study year including 5,028,314 claims.

The provider claims-based definition identified a total of 4,199,148 ED visits, the facility claims-based definition 4,795,057 visits, the ResDac definition 5,278,980 visits, and the Yale definition 5,192,235 ED visits. **Figure 1 and Table 3** The Yale definition was statistically different ($p<0.05$) than all other definitions. **Table 3 and Figure 2**. Of note, we did not identify any ED visit claims with revenue center codes 0453, 0454, 0455, 0457, or 0458 in our dataset as these revenue center codes are reserved for emergency department billing use but are not currently used and therefore did not result in the identification of any ED visits under any definition.

While no single difference between each administrative claims definition can explain observed differences in ED visit estimates, several of the clinical scenarios resulted in notable differences in the capture of ED visits. For example, inclusion of HCPCS 99291 in the operational definition to capture critical care services performed in the ED resulted in 293,083 ED visits not captured by traditional provider claims HCPCS-definitions. Also, the use of facility claims for outpatient observation services captured 40,744 claims, not otherwise captured by previously used provider and facility based definitions. A qualitative description of various clinical and billing scenarios that may explain differences between each definition is presented in **Table 4**.

Sensitivity analyses allowing for broader date of service matching between provider and facility claims demonstrated minimal changes to Yale definition ED visit estimates. Allowing for a 2-day window for matching reduced the total number of ED visits identified by 38,123 (0.73%) while allowing for a 3-day matching window reduced the total number of ED visits identified by 56,833 (1.1%), and all comparisons remained statistically difference. **Supplementary Table 2a and 2b**

Discussion

Using all relevant sources of administrative claims for Medicare beneficiaries, we found marked differences in estimates of ED visitation between four operational definitions. Operational definitions utilizing all relevant provider and facility based data sources capture more ED visits than definitions limited to narrower provider or facility specific datasets. Furthermore, our application of clinical review to generate a new operational definition of ED visitation further identified ED visits not captured by previous definitions. These definitional differences underscore the importance of developing and validating consistent, consensus-based definitions of ED visitation for researchers and policymakers.

This work provides several points of guidance to researchers seeking to use administrative claims data for emergency care research. First, use of provider claims without facility claims may identify substantially fewer ED visits. Primarily, traditionally applied provider definitions include the five primary E&M billing codes (9928x) used by emergency physicians, and in turn fail to capture the increasing use of critical care billing codes for ED professional services. Less commonly, there may be scenarios in which ED services are used for suture or packing removal (following either epistaxis or abscess drainage) that would not be billable by a physician but likely by a facility. Also, some triage only services may have been billable by facilities but not in physicians in 2012, though this practice is no longer permitted. For example, if emergency triage services are delivered as part of an advanced treatment protocol such as an EKG then a facility may produce a chargeable event without an associated emergency physician charge.[32]

Second, we found that definitions of ED visits that rely on facility claims, including the ResDac definition, do not capture a potentially meaningful proportion of ED visits in comparison to the operational definition that includes provider claims. This may be the result of a number of potential clinical scenarios involving the ED. For example, there are situations in which an accompanying professional fee Evaluation and Management (E&M) claim is not permitted under billing regulations. Such scenarios include ED-operated observation units in which E&M provider claims are not permitted for the initial emergency services will not be identified by the facility definition. In addition, the use of non-ED specific critical care HCPCS codes by emergency clinicians may not be captured by either the

facility or ResDac definitions. Also, these facility-based definitions may over count the number of ED visits by capturing outpatient hospital services labeled as "emergency services" but actually occurring outside the ED on an unscheduled basis such as hemodialysis or infusion services.[33] In addition, facility-based definitions may capture ED visits not captured by the traditional provider definition under exceptional circumstances when a primary care doctor or specialty physician evaluates a patient in the ED without emergency clinician evaluation or when a patient is briefly evaluated in ED triage, such as a patient in active labor, but rapidly moved to another part of the facility for which services are billed instead of emergency services. Conversely, the Yale definition's use of provider claims in addition to facility claims could estimate a higher number of ED visits than the facility and ResDac definitions if the matching based on the date of service between the provider and facility files creates inaccuracies. Our approach sought to limit this by setting a +/- 1 day data range resulting in 92% of facility claims overlapping a provider claim and being considered one ED visit. Our sensitivity analyses confirmed that this assumption did not materially impact results as using a less restrictive overlap of +/- 2 or +/- 3 days.

Interestingly, the ResDac definition's higher estimate of ED visitation as a result of including some potentially non-ED facility claims was offset by the lower estimation of other ED visits captured in provider claims. The comparable total ED visit count between the ResDac and Yale definition should not be interpreted as evidence of agreement, or even similarity, but rather as coincidental to various assumptions applied to the data. Furthermore, given variation in coding practices both between and within facilities, it is unlikely that analyses of ED visits for a given clinical condition, geography or hospital would be similar between the ResDac and Yale definition as a result of this balancing effect.

Given these differences between facility and provider claims, researchers interesting in studying ED utilization should utilize more comprehensive datasets to improve epidemiological accuracy and build the foundation for a future consensus definition. As more comprehensive datasets, including all-payer claims databases that include both facility and provider claims from numerous payers, become increasingly available researchers should develop algorithms that better match actual emergency care billing patterns to ensure the validity of findings.

In addition to improving the reporting, specification and rationale of operational definitions using administrative claims, future work should seek to develop a consistent, common definition for emergency care. The inherent variability in not only the organization of emergency care services, but more importantly the billing and coding of these services, is likely inevitable and necessitates a consensus definition. Previous work in other specialties such as cardiology and infectious diseases have dedicated substantial attention and resources to developing administrative-claims based definitions for

clinical entities such as acute myocardial infarction and pneumonia, yet little work has dedicated such attention to health service concept such as ED visitation or intensive care unit (ICU) services to support national epidemiologic studies and the development of quality measures.[34,35] Consistent definitions specific to each dataset are also important for the measurement of healthcare services that are not clinically defined as prior work has shown marked differences in hospital readmission measurement based on the data source or administrative claims definition used.[36-38] The development of consistent definitions would also permit researchers to conduct meta-analyses and permit policymakers to compare results of studies conducted in disparate states or geographies. Future efforts such as the Society of Academic Emergency Medicine Consensus Conference could be used to establish consensus definitions for acute care researchers.[11]

For policymakers seeking to develop metrics of ED utilization the use of a consistent and valid ED visit definition is critical to understanding the scope of quality measures, the actual effects of interventions and the degree to which subsequent policy changes are necessary. Recent work assessing the validity of hospital-level measures of AMI mortality has shown that attribution based on ED visitation can substantially impact reported hospital mortality scores based on Medicare administrative claims[39]; as such, ensuring that the underlying ED visit is accurately identified is paramount to the credibility of national quality programs.

The development of a single consensus definition of an ED visit within administrative claims would be ideal; however, the sustainability of such a definition will be challenging as billing and coding practices change. Therefore, due to current limitations in data availability, several consistent, consensus definitions may be desirable in order to support research objectives or policy purposes that require narrower or broader interpretations of emergency care. As CMS payment policy in conjunction with healthcare delivery system changes result in evolving hospital and provider billing practices, users of administrative claims data will need to continually apply clinical reasoning to capture elements of acute care that may not always be considered a traditional ED visit such as hospital based urgent care, free-standing emergency department care or select urgent procedures. Regardless of the clinical nuances of individual studies, however, the use of a consistent base definition is essential to ensuring the validity of emergency care research.

Limitations:

Several limitations of this work warrant mention. First, there is no gold standard definition for an ED visit in administrative claims; therefore, we cannot conclude that the operational definition developed is more or less accurate than alternative definitions. More detailed review would require

comparison with chart abstracted data, however that is likely to be too resource intensive to be conducted and further amplifies the need for investigations such as this. Second, our study was conducted on a Medicare dataset, which may limit the translation of the Yale definition to other commonly used administrate claims datasets with more constrained data, such as the State Emergency Department Databases (SEDD) and State Inpatient Department Databases (SIDD) assembled by the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP), in which only hospital facility claims are available. Regardless, the derivation principles outlined in this work are likely generalizable and provide guidance to both future analyses as well as users of the data. Third, because our study utilized Medicare administrative claims in which facilities and provider groups, identified by CMS Certification Number (CCN) or Tax-Identification Number (TIN) may only bill CMS for services once per day, inter-facility transfers within the same CCN or TIN may not capture both ED visits in any of the four definitions. Finally, our definition of an ED visit is based in a conceptual model seeking to identify hospital-based emergency care, which may not capture newer forms of emergency care such as some of the care delivered in freestanding emergency departments or urgent care centers for which services are billed as physician office visits and not as emergency services.

Conclusions:

Operational definitions of ED visitation used for administrative-claims based research and policy widely differ based on underlying assumptions of billing data and dataset availability. The use of a comprehensive operational definition that incorporates all relevant data sources as well as expert clinical review generates different estimates of ED visitation than operational definitions traditionally used by researchers and policymakers. Future analyses using administrative claims data should seek to validate specific definitions and inform the development of a consensus ED visitation definition to standardize research reporting and support health policy evaluation.

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Table 1: Study Sample, the 20% sample of 2012 Medicare Chronic Condition Warehouse (CCW)*

Characteristic	Beneficiaries
Age, mean (sd)	71.17 (12.33)
<65 years	1,791,260 (16.71%)
65-80 years	6,670,499 (62.24%)
>80 years	2,256,027 (21.05%)
Gender, % female	5,856,410 (54.64%)
Race, % white	8,763,178 (81.76%)
ED visit	2,356,226 (21.98%)
Observation admission	319,671 (2.98%)
Inpatient hospitalization	1,339,091 (12.49%)
SNF service utilization	384,312 (3.58%)
Hospice service utilization	255,982 (2.39%)

* The study sample included a total of 10,717,786 beneficiaries

Table 2: Analysis of related facility and provider ED visit claims

		Provider Claims									
		-4 days	**-3 days**	**-2 days**	**-1 day**	**Same day**	**+1 day**	**+2 days**	**+3 days**	**+4 days**	**Total[1]**
Facility Claims	**Hospital Outpatient Claims**	86,357 (2.02%)	85,037 (1.99%)	101,619 (2.37%)	129,158 (3.02%)	3,661,726 (85.52%)	141,716 (3.31%)	89,980 (2.10%)	76,601 (1.79%)	72,340 (1.69%)	4,281,511
	Hospital Inpatient Claims	11,697 (0.81%)	13,512 (0.94%)	12,008 (0.84%)	17,759 (1.24%)	1,106,846 (77.12%)	176,158 (12.27%)	40,916 (2.85%)	24,429 (1.70%)	19,457 (1.36%)	1,435,253
	Facility (hospital outpatient or inpatient) Claims	98,054 (1.72%)	98,549 (1.72%)	113,627 (1.99%)	146,917 (2.57%)	4,768,572 (83.41%)	317,874 (5.56%)	130,896 (2.29%)	101,030 (1.77%)	91,797 (1.61%)	5,716,764
XXXX Definition		Included as distinct ED visits			Excluded for overlap with Provider claims[2]			Included as distinct ED visits			

[1] Total numbers are numbers of ED visits after excluding duplicates from coding (for outpatient claims) and duplicates within hospitalization (for inpatient claims).

[2] A total of 87.63% Facility claims are excluded as overlap with Provider claims.

Table 3: Agreement between each ED visit Definition

		Provider Claim Definition[1]		Total
		+	-	
XXXX	**+**	4,197,848 (74.93%)	994,387 (17.75%)	5,192,235 (92.68%)
Definition	**-**	1,300 (0.02%)	408,921 (7.30%)	410,221 (7.32%)
Total		4,199,148 (74.95%)	1,403,308 (25.05%)	5,602,456

		Facility Claim Definition[2]		Total
		+	-	
XXXX	**+**	4,795,057 (85.59%)	397,178 (7.09%)	5,192,235 (92.68%)
Definition	**-**	0 (0.00%)	410,221 (7.32%)	410,221 (7.32%)
Total		4,795,057 (85.59%)	807,399 (14.41%)	5,602,456

		ResDAC Definition[3]		Total
		+	-	
XXXX	**+**	4,870,034 (86.93%)	322,201 (5.75%)	5,192,235 (92.68%)
Definition	**-**	408,946 (7.30%)	1,275 (0.02%)	410,221 (7.32%)
Total		5,278,980 (94.23%)	323,476 (5.77%)	5,602,456

[1] Provider Claim Definition = HCPCS Codes 99281 – 99285

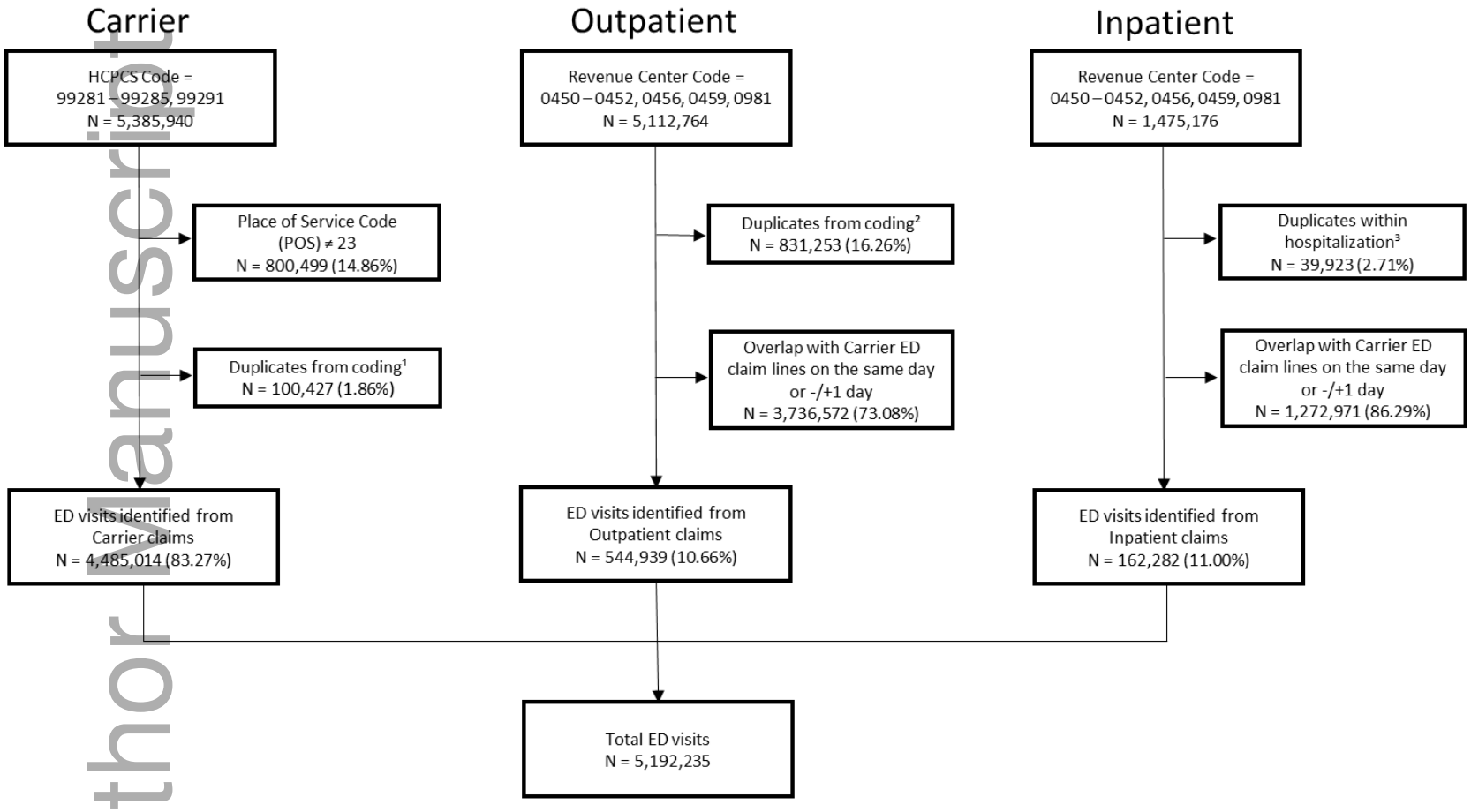
[2] Facility Definition = Revenue Center Codes 0450 – 0549, 0981

[3] RESDAC Definition = Outpatient files: Revenue Center Codes 0450-0549, 0981; Inpatient files: Revenue Center Codes 0450-0459, 0981; Inpatient MedPAR: Emergency Room Charge Amount > $0

Table 4: Clinical and billing scenario differences between ED visit operational definitions

Scenario	ED Visit Definition X = Likely ED visit identified by definition O = Likely not an ED visit identified by definition V = Variably identified by definition Empty cell = no ED visit identified by definition			
	Provider	Facility	ResDac	Yale
ED visits in which critical care codes are used to bill for ED professional services		X	X	X
Visits for which an accompanying professional fee Evaluation and Management (E&M) claim is not permitted under billing regulations		X	X	X
ED visit isolated to a single surgical procedure (i.e uncomplicated laceration repair)	V	X	X	X
ED visits for minor procedural follow up considered part of global surgical package (i.e epistaxis packing removal, suture removal)		X	X	X
Emergency triage services delivered as part of an advanced treatment protocol such as an EKG				X
ED visits preceding observation stays in which E&M services are provided by the same emergency medicine group		X	X	X
Outpatient hospital visits labeled as “emergency services” that occur outside the ED on an unscheduled basis such as hemodialysis or infusion services		O	O	
ED visit in which a primary care clinician evaluates a patient in the ED without emergency clinician evaluation	V	X	X	X
Brief ED triage evaluation, such as a patient in active labor, without emergency clinician professional services		X	V	X

Figure 1: XXXX Emergency Department Visit Definition Derivation



[1]Carrier claim lines with the same BENE_ID, LINE_1ST_EXPNS_DT, PRF_PHYSN_NPI, and TAX_NUM are considered duplicates from coding

[2]Outpatient claim lines with the same BENE_ID, REV_CNTR, and PRVDR_NUM, and both HCPCS_1ST_MDFR_CD and HCPCS_2ND_MDFR_CD not equal to 25 or 27 are considered duplicates from coding

[3]Only the first line in each inpatient claim is considered a real ED visit. The rest in the same claim are considered duplicates within hospitalization.

Figure 2: ED visit frequency based on administrative claims definition