Measuring Incident-to Billing in U.S. Physician Offices: Evidence from Electronic Health Records*

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Abstract

Advance practice providers (APPs), including nurse practitioners and physician assistants, play an increasingly important role in outpatient care delivery. Under Medicare's incident-to billing rules, services furnished by APPs may be billed under a supervising physician's National Provider Identifier (NPI), obscuring the identity of the provider who delivered care and affecting payment, workforce, and quality measurement. Existing estimates rely on linking office visits to prescription records and therefore identify incident-to billing for only a subset of outpatient encounters. We introduce a novel measurement approach using linked electronic health record (EHR) and claims to identify incident-to billing directly from discrepancies between encounter and billing provider identifiers.

Using linked EHR and billing data from 314 physician practice organizations during 2020-2022, we developed a novel measure of incident-to billing that compares the provider documented in the EHR with the rendering provider listed on the charge record, a pattern consistent with incident-to billing under Medicare rules. Applying this new measurement approach to 5.47 million office evaluation and management visits rendered by a nurse practitioner or physician assistant with both provider identifiers observed, we estimate that 42.4 percent of Internal Medicine APP encounters were incident-to-billing encounters. Incident billing was substantially more common for established patient visits than for new-patient visits and varied considerably between payer types, specialties, and practice organizations. Use of incident-to billing was also highly concentrated: the 10 percent of practices with the highest incident-to billing rates accounted for 28 percent of all incident-to encounters.

Incident-to billing also appeared across Medicare, Medicaid, and commercial insurance, suggesting that discrepancies between billing records and clinical workflows extend beyond traditional Medicare. Our findings demonstrate the feasibility of using linked EHR and claims data to directly measure incident-to billing at scale, providing a new tool for evaluating provider attribution and workforce measurement. As policymakers increasingly rely on provider-level metrics for payment, workforce planning, and quality measurement, not accounting for indirect billing practices may obscure the true contribution of APPs to outpatient care and lead to measurement of healthcare provider performance and workforce capacity.

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1 Introduction

Medicare pays differently for the same care depending on who is credited with delivering it. When advanced practice providers (APPs), including nurse practitioners (NPs) and physician assistants (PAs), see a patient, the visit can be billed directly under the APP's own National Provider Identifier (NPI) at 85 percent of the physician fee schedule. Alternatively, the visit can be billed under a supervising physician's NPI at the full physician rate, provided specific incident-to-billing conditions are met (Medicare Payment Advisory Commission, 2019; Centers for Medicare and Medicaid Services, 2026, 2024). This 15-percentage-point payment wedge sits inside a billing rule that predates today's team-based outpatient care: incident-to dates to a 1965 model built around physician-office inputs, not the modern division of labor between physicians and advance practice providers (APPs). Because claims data record only the billing clinician (not the treating clinician), payers, researchers, and workforce planners have had no direct way to observe how this payment-channel choice is exercised in practice. In particular, whether payment choice tracks the conditions Medicare attaches to it or simply tracks the financial return.

This paper studies how payment design shapes billing attribution through the case of incident-to billing. We use HealthJump data, drawn from ambulatory electronic health records, to link office visit records with their associated charge records. We then measure how often the clinical record identifies APP as the treating clinician, while the charge record lists a physician as the rendering provider. This comparison theoretically reveals differences between clinical and billing attribution that claims data alone cannot directly show.

Existing evidence has had to infer this indirectly. Patel et al. (2022) detect indirectly billed visits in Medicare fee-for-service by linking them to NP and PA prescriptions, and Mulcahy et al. (2025) extend that approach to Medicare Advantage and to non-E/M services and extrapolate to visits without a linked prescription. Both publications are confined to Medicare billed services. A related study by Neprash et al. (2021) combined claims and EHR data to construct measures of

NP autonomy and physician supervision in primary care. Instead, we observe attribution directly and across three payers: private insurance, Medicare, and Medicaid. This strategy lets us examine more than whether physician-attributed billing occurs to explore the settings and circumstances in which it occurs. We can see whether it concentrates where the financial return is largest, where the rendering clinician is least visible to the payer, or where practice norms make physician billing the default. The underlying question is whether a payment system built for a different era of physician-office practice can support today's team-based care without distorting how that care gets measured, valued, and paid for. [1]

We bridge three distinct literatures. The first is health services research and payment policy on advanced practice clinicians, which documents that APPs deliver a growing share of outpatient care and that measuring their contribution depends on knowing who actually renders a visit (Buerhaus et al., 2018; Medicare Payment Advisory Commission, 2019). A recurring finding here is that much APP-provided care is hidden in claims under physician NPIs (Patel et al., 2022; Mulcahy et al., 2025). The growing importance of APPs is evident across a wide range of locations and specialties, which all increasingly rely on nurse practitioners as part of their clinical workforce (Barnes et al., 2018; Hughes et al., 2022; Wallace et al., 2025). We measure the extent of that pattern outside Medicare for the first time, and we observe it directly in provider fields recorded in the data rather than inferring it from prescriptions. The second literature is the economics of compliance and enforcement, which studies behavior when the gains from noncompliance are clear but detection is imperfect (Becker, 1968; Allingham and Sandmo, 1972), and its applied health-care branch, which examines how providers respond to payment rules the payer cannot easily verify, through diagnosis upcoding (Dafny, 2005; Silverman and Skinner, 2004; Post et al., 2022) or risk-score intensity (Geruso and Layton, 2020). Incident-to billing sits on a related but distinct margin. Incident-to billing does not change the coded severity of a visit but rather the identity of the clinician credited with it. Because a compliant high-reimbursement pathway exists alongside a noncompliant one, incident-to billing offers a setting where payment incentive and rule compliance can point in the same or different directions. The third is the literature on health-care fraud, abuse, and improper payments, to which we contribute evidence on where physician attribution of APP-delivered visits is

[1] Oregon requires commercial payment parity for NPs (Or. Rev. Stat. § 743A.062). To our knowledge no state mandates parity specifically for the Medicare-style physician-fee-schedule differential this paper studies.

concentrated, which bears on how oversight of incident-to payments might be targeted (OIG, 2025). Our headline results speak most directly to the first: incident-to billing is both common and highly concentrated — 42.4 percent of Internal Medicine APP encounters were billed incident-to, use was substantially more common for established-patient than new-patient visits, and the 10 percent of practices with the highest incident-to rates accounted for 28 percent of all incident-to encounters. This pattern held across Medicare, Medicaid, and commercial insurance alike, indicating that the payment-channel choice we document is not a Medicare-specific artifact but a general feature of how outpatient team-based care gets billed.

2 Background

2.1 Legal mechanics

Incident-to billing is a Medicare Part B coverage and billing rule, not a category created specifically for APPs. The statutory anchor is Social Security Act Section 1861(s)(2)(A), which covers services and supplies furnished incident to a physician's professional service when they are commonly furnished in physicians' offices and commonly included in physicians' bills or furnished without separate charge (Social Security Administration, 2026). The implementing regulation at 42 C.F.R. Section 410.26 and CMS guidance describe the covered service as integral, though incidental, to the professional service of a physician or other billing practitioner, furnished in a non-institutional setting, generally under direct supervision, and provided within a course of treatment that the billing practitioner initiates and in which the practitioner remains actively involved (Office of the Federal Register, 2026; CMS, 2026b). The category is broader than APP billing alone: SSA and CMS materials apply incident-to to auxiliary personnel and office inputs more generally, including nurses, technicians, drugs, and supplies furnished as part of office-based care (Social Security Administration, 2023). For this paper, however, the empirically salient case is narrower: office-based APP services billed under a physician's NPI.

2.2 Origins and the two-channel payment system

The incident-to-billing provision is best understood as a response to the physician-office billing model that Medicare inherited in 1965. The Social Security Amendments of 1965 were written for an

outpatient setting in which delegated staff work, office supplies, dressings, injections, and practice-furnished drugs were routinely bundled into the physician's bill rather than submitted as separate professional claims (U.S. Congress, 1965; Social Security Administration, 2026). The statutory language covering services commonly furnished in physicians' offices and commonly included in physicians' bills therefore suggests a coverage rule for ordinary physician-office inputs rather than a freestanding payment channel for nonphysician workers. In that setting, incident-to enabled Medicare to pay for supervised office-based inputs without requiring a separate billing pathway for every auxiliary task.

The modern payment wedge emerged later. The Balanced Budget Act of 1997 broadened direct Medicare billing for nonphysician practitioner services while leaving incident-to in place (U.S. Congress, 1997; OIG, 2001). The result is a two-channel structure. APP services can therefore be billed through two channels: directly under the APP's own NPI at the reduced nonphysician-practitioner rate, or, when the supervision and treatment-course requirements are satisfied, under a supervising physician's NPI at the full physician rate (CMS, 2026a,c,b). The wedge now familiar in policy debate is thus the product of layering modern APP billing rights onto an older physician-office ancillary billing rule. That structure has been in place for nearly three decades and has become more salient as APPs have taken on a larger role in outpatient care.

2.3 Persistence, transparency, and measurement

Incident-to persists in part because it still serves legitimate office-practice functions. Routine physician-office care continues to rely on nurse-administered injections, technician services, dressings, drugs, and other supervised inputs that Medicare has long treated as part of a practitioner-led office episode. The supervision requirement functions as the program-integrity guardrail, and the breadth of the category helps explain why reform efforts have focused more narrowly on requiring NPs and PAs to bill directly for services they personally furnish, rather than abolishing the entire incident-to category (Medicare Payment Advisory Commission, 2019).

At the same time, the rule creates a persistent transparency problem. OIG has long treated this opacity as a program-integrity concern, and its current work plan continues to identify Medicare Part B incident-to payments as an oversight issue (OIG, 2001, 2025). MedPAC likewise emphasizes that the same opacity affects payment, quality measurement, workforce measurement, and attribu-

tion (Medicare Payment Advisory Commission, 2019). Recent claims-based studies have quantified the scale of this misattribution and its importance for understanding who delivers outpatient care (Patel et al., 2022; Mulcahy et al., 2025; Buerhaus et al., 2018). The resulting empirical question is the one this paper takes up: when claims cannot directly observe supervision or true producer identity, can the operational record inside the physician office distinguish operationally plausible physician-supervised team care from nominal physician attribution of APP-furnished work?

3 Data

The analysis uses electronic health record (EHR) data from HealthJump, a national health data interoperability platform that aggregates and standardizes records from multiple EHR vendors. HealthJump harmonizes information across participating providers and health systems, creating a common data structure that facilitates analysis across otherwise disparate EHR platforms. The database contains records for millions of patients across the United States and includes patients covered by a variety of payer types. Unlike traditional claims databases that primarily capture billed services, HealthJump contains clinical and practice-management information recorded during care, including diagnoses, procedures, medications, laboratory orders and results, vital signs, appointment records, and charge records.

A key advantage of the HealthJump data for this study is that encounter records can be linked to charge and procedure records for a subset of office visits. In our implementation, the charge file supplies the cleanest charge-side provider identifier, while an encounter-to-NPI crosswalk supplies the encounter-side provider identifier. For example, a nurse practitioner sees an established patient for a follow-up visit; the EHR records the NP as the treating clinician, but the charge record lists a physician as the rendering provider. We classify this discordant pattern as consistent with incident-to billing. The surrounding timestamps and hashed locations provide workflow context. This does not let us directly observe who physically delivered care or the legal billing basis for every visit. Instead, we compare encounter-side provider identifiers with charge-side or procedure-side provider identifiers when both are observed and linkable. Discordance between those fields provides our measure of attribution mismatch, and the accompanying timestamps and hashed locations allow us to assess whether the physician attributed to the service appears operationally available in the

surrounding workflow.

As with many EHR-based datasets, the available time series is shorter than in traditional administrative claims data, and provider participation may vary across regions and over time. For this study, however, the key advantage is not long-run claims continuity but the joint presence of encounter context, charge-side provider identifiers, timestamps, and hashed locations, which together allow us to measure attribution discordance and operational plausibility within office workflows.

4 Measurement Strategy

We began with approximately 17.9 million office evaluation and management (E&M) encounters delivered in physician-office settings between 2020 and 2022 for which both encounter-side and charge-side provider identifiers were present. Our primary analytic sample is the 5.47 million of these encounters rendered by a nurse practitioner or physician assistant, drawn from 314 physician practice organizations. We define an incident-to billing encounter as an office visit for which the encounter-side provider is an APP and the charge-side rendering provider is a physician. This definition does not establish whether all Medicare incident-to requirements were satisfied; it identifies the billing attribution pattern associated with incident-to billing. Throughout, we use "billed under a physician" and "incident-to billing encounter" as shorthand for this charge-side attribution pattern.

The organizations in HealthJump include a diverse mix of primary care and specialty practices across multiple regions and payer types, with higher representation in a few key states including California, North Carolina, and Tennessee (see Appendix Figure A.1).

Provider type for advanced-practice designation is identified through NPI taxonomy codes, academic degree, and specialty, then classified into physicians, nurse practitioners, physician assistants and other provider categories. Because our measure relies on discrepancies between encounter-side and charge-side provider identifiers, not all discordant records necessarily reflect incident-to billing. Discordance may also arise from shared documentation workflows, physician supervision arrangements, or data-entry conventions. Conversely, incident-to billing may occur without observable discordance when encounter-side provider information is not available. The measure should there-

fore be interpreted as a record-based indicator of billing attribution divergence between clinical workflow and reimbursement records rather than a direct measure of regulatory compliance. This attribution discordance provides a window into how modern team-based care is translated into an administrative payment system that ultimately assigns responsibility for a visit to a single billing clinician.

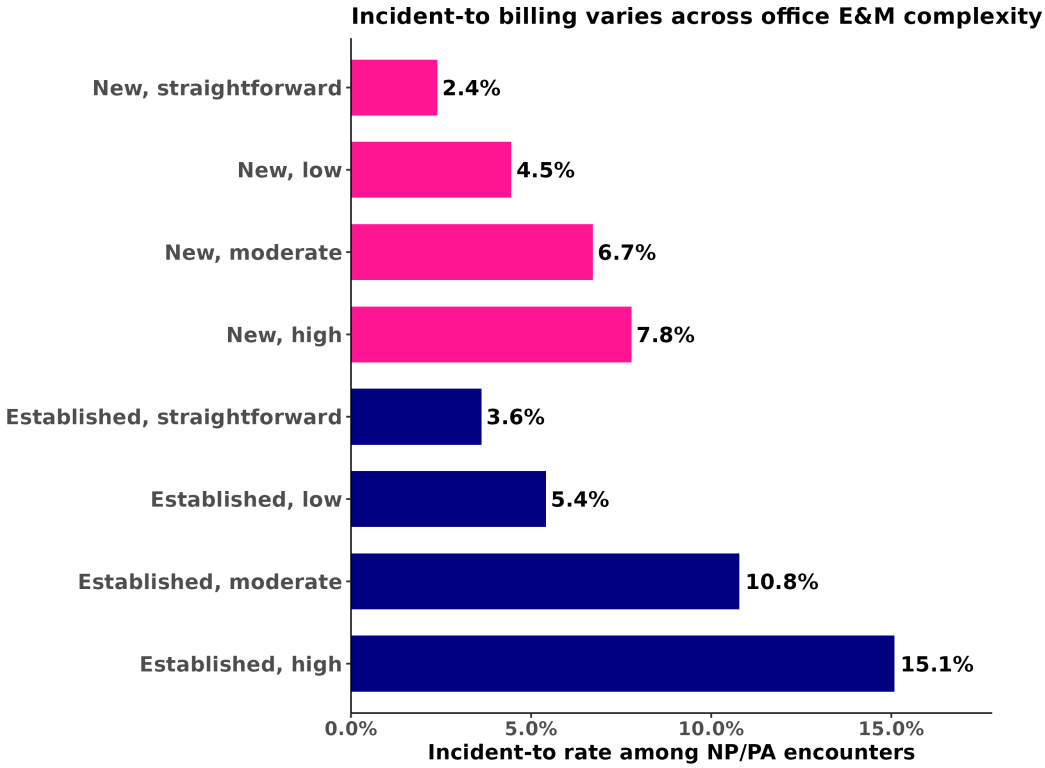
5 Results

5.1 Incident-to billing prevalence among APP-delivered office visits

Using linked encounter and charge records, we identified E&M visits in which an APP was recorded as the encounter provider while a physician was listed as the charge-side rendering provider. We interpret this pattern as consistent with incident-to billing, although the data do not permit direct observation of Medicare compliance requirements. Across 2020-2022, incident-to billing occurred in a substantial share of APP office visits. Overall rates were stable over time, suggesting that the billing practice was well established rather than a temporary response to pandemic-related disruptions and that indirect billing was a persistent feature of outpatient practice workflows. Among APP encounters with observable provider identifiers, approximately 6.9 percent were billed under a physician NPI rather than the APP's own identifier.

Overall, incident-to billing is higher for established patients compared with new patients, and higher for patients with higher clinical complexity as compared with those whose visits were classified as straightforward. For example, among APP encounters, 15.1% were consistent with incident-to billing among established patients with high complexity visits, while only 2.4% were consistent with incident-to billing among new patients with straightforward E&M visits, see Exhibit 1. This billing pattern in these EHR-based data is consistent with recent claims-based estimates showing widespread use of indirect billing arrangements in physician offices (Buerhaus et al., 2018; Patel et al., 2022; Mulcahy et al., 2025). Unlike prior studies that rely on prescription linkage, however, our approach captures encounters regardless of whether a prescription was written, allowing incident-to billing to be observed for a broader set of office visits.

Figure 1: Incident-to billing overall rates



Authors' analysis of linked HealthJump electronic health record and billing data, 2020–2022. The sample includes office-based evaluation and management encounters rendered by a nurse practitioner (NP) or physician assistant (PA) for which both encounter-side and charge-side provider identifiers are observed. An encounter is classified as consistent with incident-to billing when the encounter-side provider is an NP or PA and the charge-side rendering provider is a physician. Categories distinguish new versus established patients and E-M complexity. Percentages are unadjusted shares of NP/PA-rendered encounters within each category. This measure identifies physician attribution of APP-rendered encounters but does not establish whether all Medicare incident-to billing requirements were satisfied.

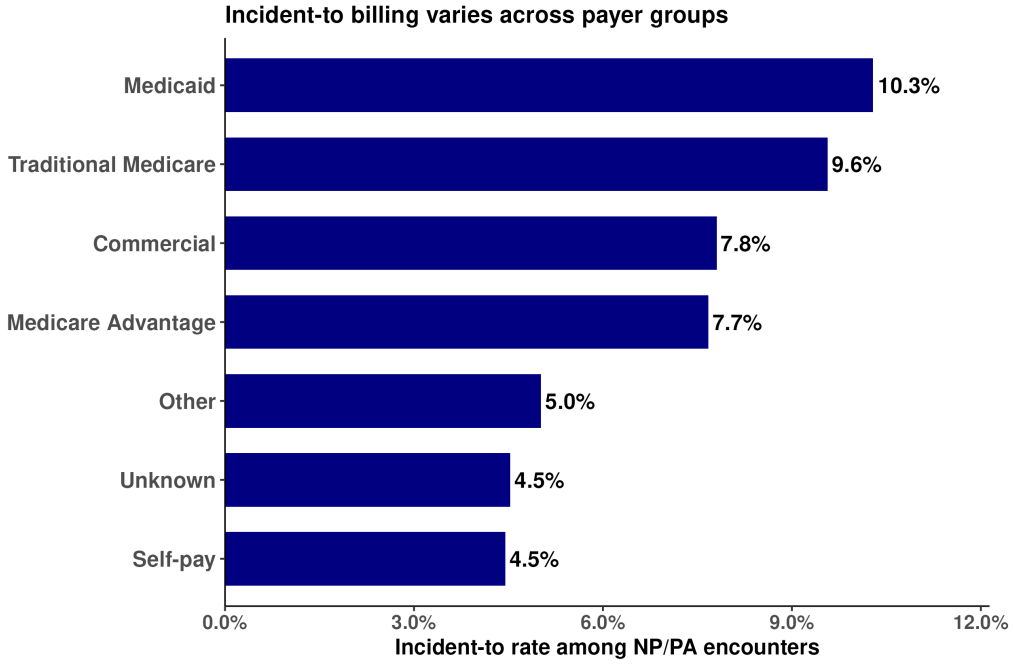
5.2 Incident-to billing varied substantially across payer types

Exhibit 2 shows that rates of incident-to billing differed considerably across insurance categories. Among APP Medicaid encounters, 10.3% are consistent with an incident-to billing pattern. Medicaid showed the highest rates of physician-attributed APP encounters, followed by traditional Medicare. Although incident-to billing is traditionally discussed in the Medicare context, we also identified common attribution discrepancies among commercially insured patients. This finding suggests that billing practices associated with physician attribution may extend beyond the federal payment rules that originally created incident-to billing. One interpretation is that physician-attributed billing becomes embedded in organizational workflows and is then applied across payer types. On the other hand, some private insurers may establish reimbursement structures that create incentives similar to those found in Medicare. Regardless of the mechanism, the results indicate that provider attribution in administrative data may differ from actual care delivery across a much broader set of patients than previously recognized.

5.3 Incident-to billing differed across specialties

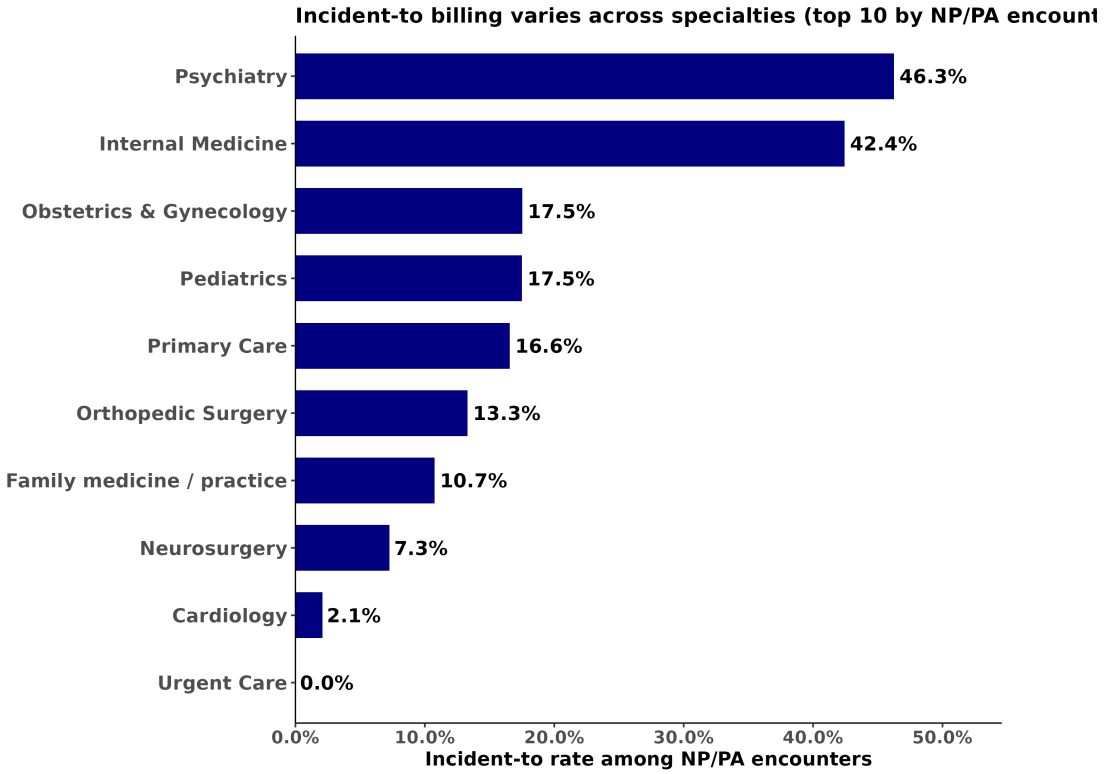
Exhibit 3 demonstrates that specialty-level variation was also substantial. Psychiatry and Internal Medicine exhibited particularly high rates of incident-to billing among APP encounters, with approximately 46.3 percent and 42.4 percent of APP visits billed under physician identifiers, respectively. Family medicine and several other office-based specialties also demonstrated frequent physician attribution, while some specialty practices showed substantially lower rates. These differences likely reflect variation in care organization rather than differences in payer policy alone. NP roles and relationships with physicians differ between primary and specialty care, suggesting that specialty-level variation in physician attribution may reflect differences in how clinical teams organize and divide responsibility (Winter et al., 2021). Primary care settings often employ APPs in ongoing management of established patients, creating circumstances in which physician supervision and physician-attributed billing can be operationally feasible. Specialties with less APP involvement or more episodic care patterns may have fewer opportunities for indirect billing. The overall pattern suggests that incident-to billing is not a uniform national phenomenon, but rather it depends heavily on how practices deploy APPs within clinical teams (Mitchell et al., 2019; Bhai

Figure 2: Incident-to billing among APP encounters by payer



Notes: Authors' analysis of linked HealthJump electronic health record and billing data, 2020–2022. The sample includes office E-M encounters rendered by NPs or PAs with observable encounter-side and charge-side provider identifiers. An encounter is classified as consistent with incident-to billing when the encounter-side provider is an NP or PA and the charge-side rendering provider is a physician. Bars report the unadjusted percentage of NP/PA-rendered encounters meeting this definition within each payer category. Medicare's formal incident-to rules apply to traditional Medicare; analogous physician-attribution patterns observed for Medicare Advantage, Medicaid, commercial insurance, and other payers may reflect payer-specific billing arrangements or organizational billing practices rather than Medicare incident-to billing rules.

Figure 3: Incident-to billing among APP encounters by specialty



Notes: Authors' analysis of linked HealthJump electronic health record and billing data, 2020–2022. The sample includes office E-M encounters rendered by NPs or PAs with observable encounter-side and charge-side provider identifiers. An encounter is classified as consistent with incident-to billing when an NP or PA is recorded as the encounter provider and a physician is recorded as the charge-side rendering provider. The figure reports unadjusted rates for the 10 specialties with the largest number of NP/PA-rendered office E-M encounters [Jaehyun is that our criteria??]. Specialty is determined from [Where did we get specialty? Is that from physician compare?]. Rates should be interpreted as physician attribution of APP-delivered encounters and do not establish regulatory compliance with Medicare incident-to requirements.

et al., 2025). As a result, workforce estimates based on claims may be more susceptible to physician attribution bias in some specialties than in others.

5.4 Incident-to billing was highly concentrated among a small number of practices

The most striking finding was the degree of concentration across organizations, shown in Exhibit 4. Although incident-to billing was common overall, most of these patterns were concentrated among a relatively small subset of practices. Many organizations rarely (or never) used physician

attribution for APP encounters, while a much smaller group relied on it extensively. Variance decomposition analyses similarly indicated that most observed variation occurred between practices rather than within the same practice over time. Approximately 96 percent of the variation in incident-to billing rates was attributable to persistent differences across organizations rather than temporal fluctuations within organizations (see Figure A.2). This pattern suggests that attribution choices are embedded in organizational routines and billing systems that mediate how team-based care is represented within the payment system, rather than chiefly arising from encounter-specific clinical decisions. Practices employ diverse combinations of physicians, APPs, nurses, and other clinical staff, and while staffing arrangements may be shaped by local clinician supply, patient characteristics, and scope-of-practice regulations, these differences may also govern how practices organize care and how they map care onto a payment framework originally developed for a more physician-centered model of outpatient practice (Ku et al., 2015; Bhai et al., 2025).

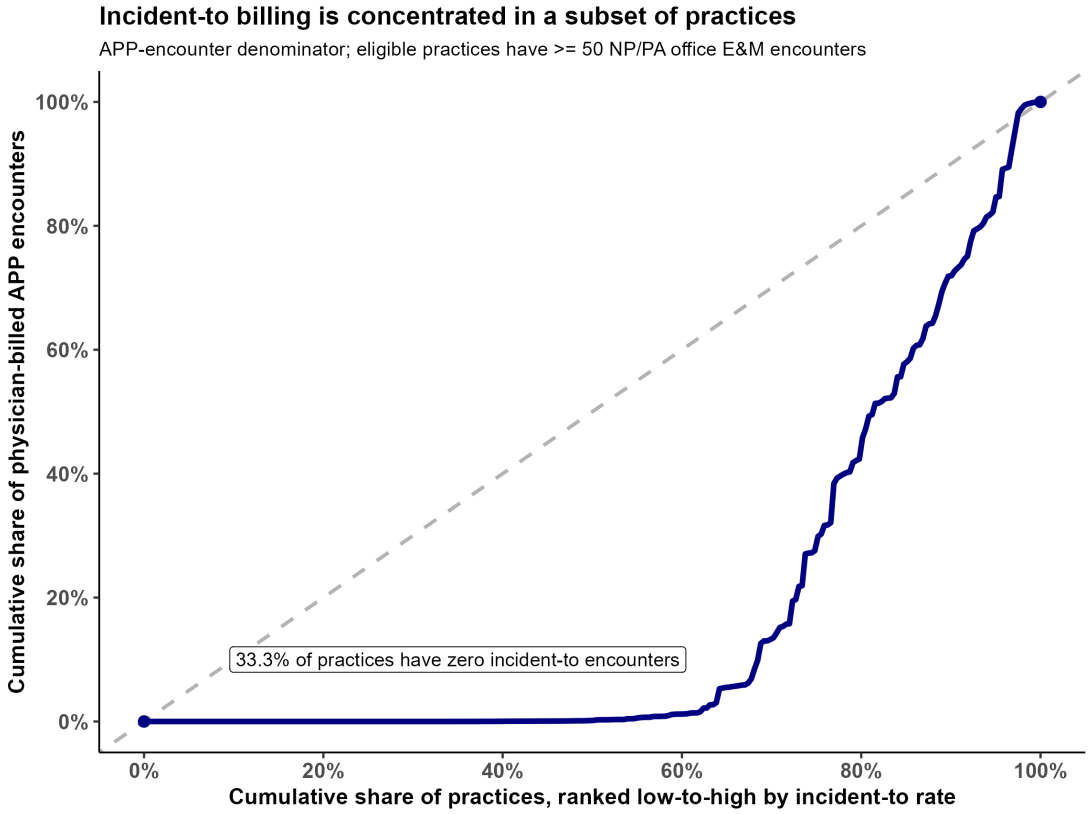
The concentration of incident-to billing has important policy implications. Efforts to improve transparency in provider attribution may affect a relatively small set of high-use organizations disproportionately. Analyses of APP workforce contributions based solely on claims records may generate larger measurement errors in those organizations where indirect billing is most prevalent.

Our findings suggest that physician attribution of APP-delivered office visits is both common and highly uneven across the outpatient sector. While incident-to billing occurred across payer types and specialties, its use was concentrated in a relatively small number of organizations that appeared to rely systematically on physician-attributed billing. These patterns imply that provider identifiers in administrative data (where encounters are attributed to only one provider) may not consistently represent the healthcare professional who delivered the care, with implications for workforce measurement, quality assessment, and payment policy.

6 Discussion

Using linked EHR and billing records, we directly identified physician-attributed billing of APP-delivered visits and found that it varies by visit type and complexity (Figure 1), payers (Figure 2, and specialty (Figures 3). The most striking finding is that physician-attributed APP billing is overwhelmingly concentrated within a relatively small subset of organizations (Figures (4 and A.2).

Figure 4: Incident-to billing is highly concentrated among the practices that utilize it



Notes: Authors' analysis of linked HealthJump electronic health record and billing data, 2020–2022. The sample includes office-based evaluation and management encounters rendered by nurse practitioners or physician assistants with both encounter-side and charge-side provider identifiers observed. An encounter is classified as consistent with incident-to billing when the encounter-side provider is an NP or PA and the charge-side rendering provider is a physician. The figure shows the concentration of these encounters across physician practice organizations. This measure captures physician attribution of APP-rendered encounters and does not establish whether all Medicare incident-to billing requirements were satisfied.

Existing studies inferred incident-to billing indirectly from prescriptions (Patel et al., 2022; Mulcahy et al., 2025); our approach observes attribution directly and across Medicare, Medicaid, and commercial insurance. Incident-to billing appears to be embedded within organizational workflows and billing cultures as opposed to a series of isolated billing decisions made encounter-by-encounter, consistent with established organizational workflows and administrative routines rather than isolated claim- or encounter-level decisions. Given this finding, organizational billing systems and practice-management policies may be important for policymakers since interventions focused on individual providers may have limited impact.

Once adopted, physician-attribution practices may persist across payers, even where Medicare incident-to rules do not directly apply. This finding suggests that attribution patterns are shaped by both payer-specific incentives and organizational routines that transcend individual reimbursement systems. While we quantify approximately how much indirect billing exists among different payers and specialty types, our findings also imply that physician attribution is a broader organizational convention.

Incident-to billing is often framed either as an important mechanism supporting team-based care or as a source of opacity in claims-based measurement. Our findings suggest that both perspectives contain some truth. By allowing physician-APP teams to receive reimbursement at the physician rate, incident-to billing may improve financial viability in practices serving publicly insured populations. At the same time, this mechanism obscures the identity of the provider furnishing care, creating challenges for workforce measurement, accountability systems, and the evaluation of provider performance. The policy question is not whether incident-to billing is inherently desirable or undesirable, but rather how policymakers should balance financial support for team-based care against transparency regarding who delivers care.

As policymakers increasingly rely on provider-level data for workforce planning, quality measurement, and performance evaluation, accurate attribution of care delivery becomes increasingly important. Physician and APP identifiers are routinely used to estimate workforce supply, productivity, service delivery patterns, and provider performance. To the extent that claims reflect billing attribution rather than care delivery, analyses based solely on billing records may systematically understate APP contributions and overstate physician involvement. These concerns remain even when physician-attributed billing is fully compliant with applicable billing rules.

A systematic review found that expanded NP practice authority was associated with greater NP supply and improved access in rural and underserved areas, without evidence of diminished care quality (Yang et al., 2021). Although scope-of-practice debates typically focus on whether NPs require physician oversight, our findings suggest an additional question: how provider attribution should be recorded when care is delivered by interdisciplinary teams. Even if NP scope-of practice restrictions continue to relax, questions surrounding provider attribution will endure because team-based models depend on multiple clinicians contributing to patient care, and claims systems that attribute services to a single billing provider may continue to obscure the actual clinical division of labor. Reforms that expand NP autonomy may address professional supervision requirements without resolving attribution challenges for workforce measurement, quality assessment, or provider accountability.

Our findings suggest that policymakers face a tradeoff between preserving flexibility in team-based care and improving transparency regarding who delivers care. Some ways to improve transparency without disrupting team-based care might include requiring claims to indicate the rendering service provider and the billing provider (which would preserve existing payment policies while improving transparency) or reducing or eliminating payment differentials between physician and APP billing (weakening the incentives for physician attribution). Because physician-attributed billing is highly concentrated, oversight efforts focused on organizations with unusually high rates may be more efficient than broad-based enforcement approaches. The distinction between "who furnished care" and "who billed care" is a fundamental measurement issue that affects how researchers, policymakers, and health systems understand the composition and performance of the outpatient workforce. These measurement challenges are distinct from questions of compliance. Even when incident-to billing is legally appropriate, claims may identify the clinician who received payment rather than the clinician who delivered care.

Limitations Our methodology of linking billing claims with EHR to identify physician-attributed APP encounters cannot determine whether all Medicare incident-to requirements were satisfied. HealthJump is not nationally representative. We observe patterns consistent with organizational strategy and financial incentives, but we cannot directly observe managerial intent. Commercial and Medicaid physician-attribution patterns may not reflect Medicare incident-to reg-

ulations specifically.

7 Conclusion

As advanced practice providers (APPs) assume an increasingly central role in outpatient care delivery, accurately identifying who provides care has become more important for payment policy, workforce planning, and health services research. Using linked electronic health record and billing data from 314 physician practice organizations, we developed a direct measure of physician-attributed APP encounters that does not rely on prescription linkage and can be applied across Medicare, Medicaid, and commercial insurance. Our findings show that physician attribution of APP-delivered care is common, varies substantially across payer types and specialties, and is highly concentrated within a relatively small number of organizations.

These findings suggest that incident-to billing reflects broader organizational billing practices that shape how care is recorded in administrative data and is not merely a feature of Medicare reimbursement policy. Provider identifiers may not always represent the clinician who delivered care, creating challenges for workforce measurement, provider attribution, and evaluations of health care delivery. These measurement concerns arise even when physician-attributed billing is fully compliant with existing regulations. Our findings also support the assertion that a payment architecture developed for physician-centered offices is now being used to accommodate increasingly team-based care.

Balancing the financial flexibility incident-to billing provides physician-APP teams against the transparency needed to understand who delivers care is a significant policy challenge. Team-based care depends on flexibility in how care delivery responsibilities are shared; effective payment and workforce policy depends on accurately identifying who contributes to delivering that care. Our findings suggest that incident-to billing sits at the intersection of those two goals. As APPs continue to expand their role in outpatient care, improving the visibility of both rendering and billing providers may become increasingly important for workforce planning, accountability, and health policy evaluation.

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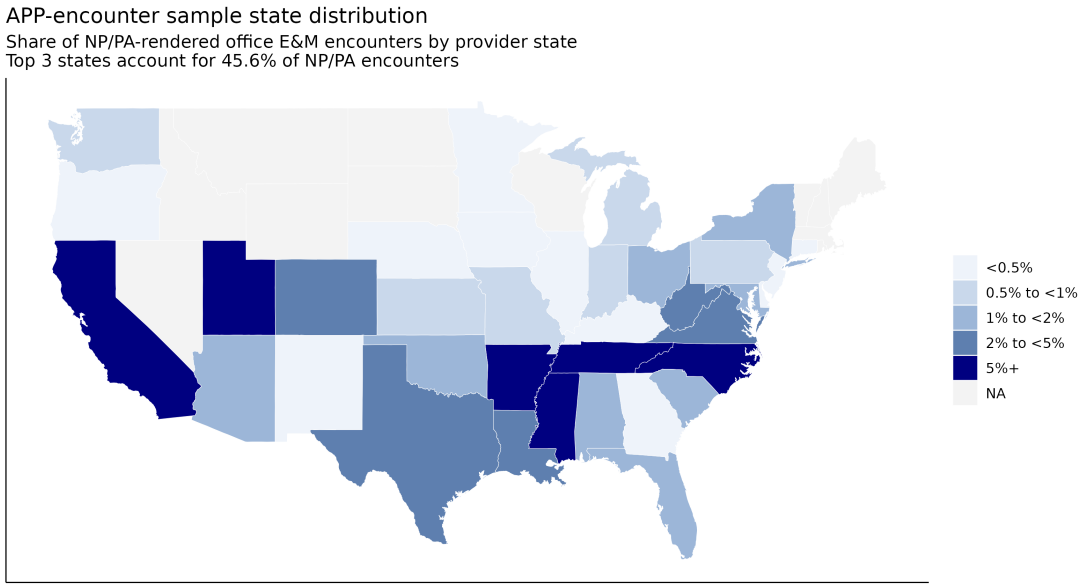
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Figure A.1: Geographic distribution of the APP-encounter analytic sample. Share of pooled NP/PA-rendered office E&M encounters by the encounter-side provider's registered state.



A Appendix

Figure A.2: Between- versus within-practice variance in incident-to billing rates, APP-encounter denominator.

