



From Ghost Directories to Golden Networks

An AI-Native, Self-Learning Infrastructure for Optimizing Provider Data

"Sunny's AI-native, self-learning directory and voice platform can both audit and solve the ghost directory problem, effectively replacing manual call center sweeps with automated outreach to every provider."

38%

Total ghost rate across
major carrier directories

91%

Sunny directory provider
location accuracy

ABSTRACT

Provider directories sit at the front door of healthcare, yet decades of audits show that a significant proportion of listings contain material errors, creating "ghost directories" that waste patient time and erode trust. Sunny Health AI conducted AI voice scheduling calls to healthcare providers listed as in-network in major carrier directories and found that **4% of the phone numbers failed to even connect** and **36% of the connected offices said the listed provider did not work there**, for a total **38% ghost rate**. The total ghost rate was higher for dental than medical (46% vs 33%), with variations across states, specialties, and population densities. Sunny's AI-native, self-learning directory and voice platform can both audit and solve this ghost directory problem, effectively replacing manual call center sweeps with automated outreach to every provider, in the process giving plans a scalable path to maintain accurate directories while dramatically reducing administrative cost.

4%

Of phone numbers failed to connect — immediate error tone

36%

Of connected offices: listed provider did not work there

38%

Total ghost rate across all 2,439 calls

Introduction

Healthcare provider directories remain surprisingly unreliable, even as they function as a primary gateway to care for patients and families. Across multiple national audits and peer-reviewed studies, 25 to 48% of provider listings were found to contain material inaccuracies such as wrong locations and disconnected or incorrect phone numbers,

creating what many patients experience as a "ghost directory" of providers who cannot actually be reached or booked.^{1,2,3} These data quality gaps translate directly into patient friction and compliance risk, as members waste time on unusable listings while plans incur administrative burden and potential penalties for failing to maintain accurate networks.

At Sunny Health AI, we are committed to closing this accuracy gap at the moment it matters most: when a patient or family is trying to get care. Sunny's AI-native health navigator engages members to understand their insurance coverage, clinical needs, and provider preferences, then automatically schedules appointments with in-network providers using voice AI technology and a proprietary, self-learning provider directory that continuously updates from omnichannel data sources, including ground truth insights gathered via AI-driven scheduling calls.

In this paper, we describe a targeted evaluation and remediation of carrier directory accuracy and demonstrate how Sunny Health AI's self-learning directory can use scheduling findings along with other data signals to longitudinally improve and maintain provider directory quality.

Methods

We conducted a cross-sectional, descriptive analysis of directory accuracy using outbound scheduling calls placed by Sunny's voice AI navigator to **1,381 medical and 1,058 dental providers** listed as in-network in major carrier directories. The sampled providers spanned five states: New Jersey, North Carolina, Colorado, Oklahoma, and Oregon. Providers were selected based on being listed as in-network at the listed phone number and practice address at the time of call.

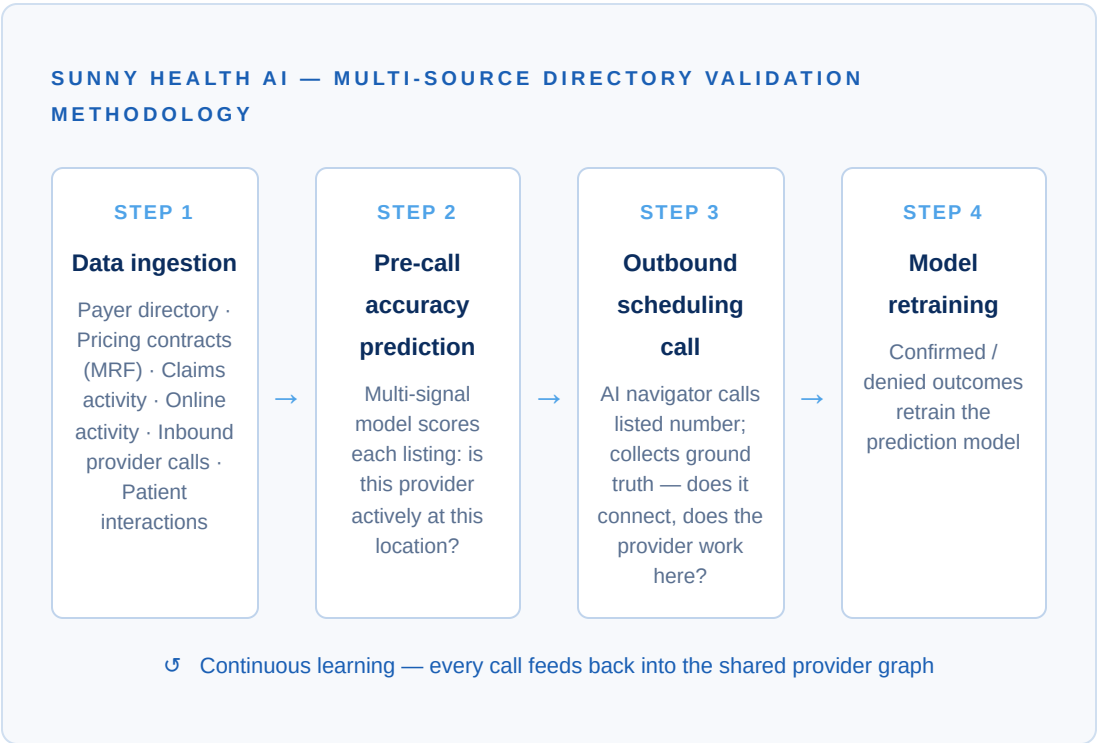
For every scheduling call attempt, we sought to answer two basic scheduling questions:

1. Does the call connect (i.e., does it avoid an immediate error tone or failed connection)?
2. If the call reaches office staff, does the named provider currently practice at that location?

We first recorded whether the call technically connected, defined as not terminating in an immediate error tone. Among calls that connected to a receptionist (either directly or via

interactive voice response [IVR]), we then inquired whether the named provider currently worked at that location. The receptionist's affirmative or negative response was treated as ground truth for the provider's employment at the dialed practice site, and the resulting call-level outcomes was used to label each directory listing as valid or invalid for practical scheduling purposes and for interpreting the accuracy of the carrier's provider directory.

To better understand how directory performance varied across contexts, we also conducted subanalyses that stratified results by state, specialty, and local population density. This stratification allowed us to examine whether ghost directory effects were more pronounced in specific geographies or types of practices.



Results

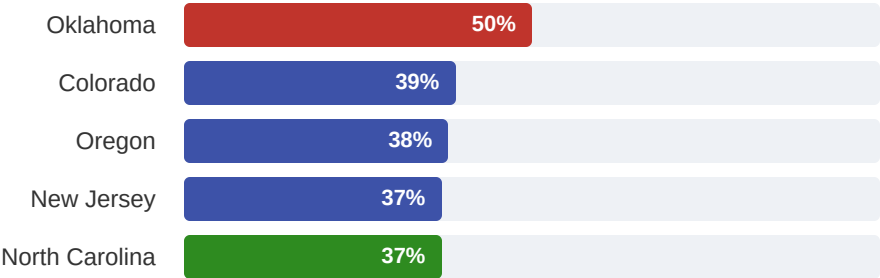
Major Carrier Directory Ghost Rates



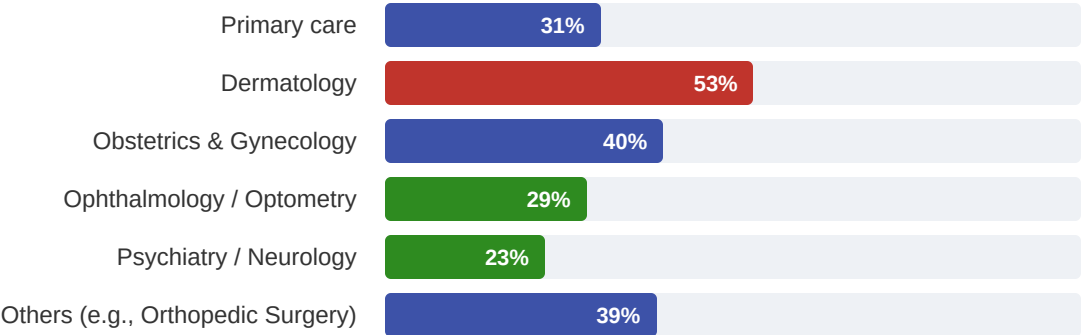
Among the 2,439 medical and dental providers called in this study, 93 (4%) calls failed to connect and immediately terminated in an error tone. Among the remaining 2,346 calls that connected to a receptionist, 1,503 (64%) confirmed that the provider still worked at the listed contact in the carrier's directory, while 843 (36%) reported that the provider did not work there. Taken together (failed-to-connect calls and "does not work here" responses), **the total ghost rate was 38%.**

The total ghost rate was **higher for dental providers than medical providers (46% vs 33%)**, and varied by state (ranging from 37% in North Carolina to 50% in Oklahoma) and specialty (ranging from 23% for psychiatry/neurology to 53% for dermatology, and from 34% for pediatric dentistry to 55% for periodontics). Ghost rates were broadly consistent across population densities, ranging from 38-40%.

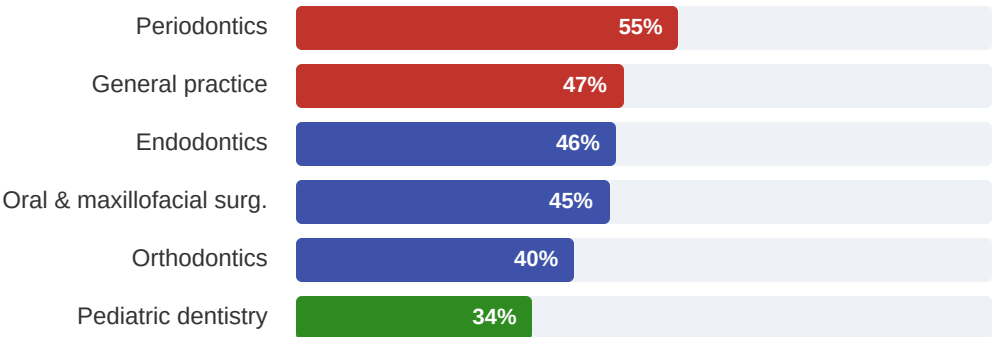
TOTAL GHOST RATE BY STATE



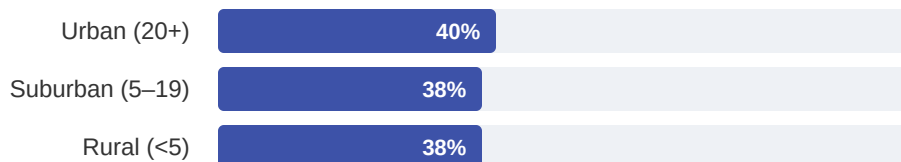
TOTAL GHOST RATE BY MEDICAL SPECIALTY



TOTAL GHOST RATE BY DENTAL SPECIALTY



TOTAL GHOST RATE BY AREA TYPE



Sunny Directory Performance

Alongside this evaluation, we assessed Sunny's proprietary, self-learning directory and voice platform on the same provider sample. Sunny's system combines provider online presence, prior scheduling interactions, payer data, and claims-based signals to estimate, *before any call is placed*, whether a provider is likely to be active and reachable at a given location.

When applied to the same carriers' dataset, **Sunny's directory scored 91% for provider location accuracy** and augmented with multiple layers of enrichment (e.g., email, location and office hour changes, provider work schedules, clinical focus, etc). This demonstrates that AI-powered feedback loop infrastructure can not only quantify ghost-network risk but also give carriers a scalable, operations-ready path to continuously target, remediate, enrich, and monitor directory accuracy for all members.

Discussion

Our findings confirm that ghost listings are a defining feature of today's carrier provider directories. Nearly 2 in 5 listings a patient might call would lead to wasted time and guaranteed no appointment. These dead ends compound a broader healthcare coordination burden that The Harris Poll found consumes 8 hours per month for U.S. adults, equating to 25 billion hours collectively as a nation every year.⁴

Why legacy approaches fail

Despite a robust ecosystem of data vendors attempting to solve this issue, ghost networks remain pervasive. This intractability points to a deeper structural mismatch: legacy

directories are largely downstream artifacts of billing systems, not purpose-built patient access tools. Designed primarily for credentialing and claims adjudication, they inherently track a provider's contractual footprint rather than their real-time clinical availability. This baseline complexity is frequently compounded by institutional incentives. For example, to safeguard against claim denials, revenue cycle teams often practice defensive over-association, linking a provider's NPI to multiple facilities regardless of actual scheduling capacity.

When industry vendors attempt to cleanse these directories, they typically rely on aggregating recent claims and transparency-in-coverage contracting files (MRFs). However, this fundamentally misinterprets what these datasets measure. They map financial authorization, confirming where a provider is credentialed to bill and has successfully done so in the past; they cannot reliably distinguish a primary, full-time clinic from an incidental, once-a-month satellite office, nor do they capture when a provider has quietly stopped rotating through a specific facility. As long as these lagging, financially driven artifacts are repurposed as the sole proxy for patient access, traditional data aggregation will struggle to eliminate ghost networks.

The policy environment is tightening

The persistence of ghost directories has not gone unnoticed by policymakers. Proposals such as California's AB 280⁵ and the federal REAL Health Providers Act⁶ seek to tighten verification requirements, establish minimum accuracy benchmarks, and penalize plans that fail to maintain usable directories. Yet despite this growing legislative attention, incentives for carriers remain diffuse, enforcement is only beginning to take shape, and, until now, the industry has lacked a clearly scalable, operations-grade model for continuously cleansing and enriching directory data.

A self-learning path forward

Sunny's AI-native self-learning directory platform is designed to fill that gap. In our evaluation, Sunny's pre-call validity scoring achieved 91% accuracy — an early, conservative floor as performance will compound in cadence with the platform ingesting greater call volume and longitudinal signals across plans and markets. By converting every scheduling and eligibility verification call into structured ground truth, and feeding those signals along with other data sources back into a shared provider graph, Sunny offers a

practical path from one-time compliance exercises to an always-on infrastructure for directory accuracy and access navigation.

"If plans, providers, employers, and policymakers choose to embrace this live, feedback-driven directory approach rather than static spreadsheets and PDFs, they can dramatically reduce the wasted dials and dead ends patients face today, and instead empower patients with a golden directory platform that helps every patient reach the right provider, at the right place, at the right time."

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