Measuring the Invisible Work of Epic In-Basket Messaging in Outpatient Psychiatry

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Nicolas Lescano, MD

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Contents

1 Executive Summary

This study quantifies the "invisible work" of Epic in-basket messaging in outpatient psychiatry. Using de-identified audit data (July 2024–June 2025) from 56 clinicians, we measured message volume, handling time, timing (after-hours), and variation across providers. Clinicians spent 1,925.4 hours on inbox work, equivalent to 1.01 FTE, with 40.2% after hours; workload varied 27.5× between lowest and highest. Twelve clinicians (21%) accounted for a disproportionate share, suggesting concentrated risk for burnout and error. This study evaluates the proposed MPM responsiveness metric (>=85% within two business days, 5% of incentive) and shows how unadjusted timeliness targets, without staffing or case-mix adjustment, can amplify burden on high-need panels. We recommend making inbox work visible in capacity planning, adjusting metrics for panel complexity and coverage, implementing team-based routing, and providing dedicated support. Recognizing and resourcing inbox work is essential for safe, sustainable outpatient psychiatry.

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1. Problem Statement and Significance

1.1 The Invisible Work Problem

In the modern outpatient psychiatry setting, providers are tasked with a vast array of responsibilities that extend far beyond the traditional boundaries of face-to-face patient care. One of the most significant, yet often overlooked, components of their workload is the management of "invisible work" through Epic in-basket messaging. This invisible work encompasses a multitude of tasks, each demanding clinical expertise, careful judgment, and a considerable investment of time.

Providers routinely respond to patient portal messages, which often involve medical advice requests that require thoughtful, individualized responses. They also manage patient call messages, which are documented and handled within the Epic system, ensuring that every patient concern is addressed in a timely and clinically appropriate manner. The review of laboratory and imaging results is another critical responsibility, as providers must interpret findings, communicate results, and coordinate any necessary follow-up care. Prescription refills and authorizations, while seemingly routine, require careful consideration of patient safety, medication interactions, and regulatory requirements. In addition, providers engage in inter-provider communication, such as consulting with colleagues or cosigning charts, which is essential for coordinated, high-quality care. There are also numerous other in-basket tasks that demand ongoing attention.

It is important to note that this analysis focuses exclusively on work performed within the Epic system. Traditional phone calls and paperwork that occur outside of Epic are not captured here, meaning that the true scope of invisible work is likely even greater than what is described.

Despite the complexity and importance of these tasks, they are almost entirely absent from the metrics traditionally used to measure provider productivity, such as Relative Value Units (RVUs) and visit counts. This omission creates a profound disconnect between what is measured and the actual effort expended by providers. As a result, the true scope

of provider work remains hidden, leading to a fundamental misalignment between institutional expectations and the realities of clinical practice.

1.2 Human Factors Implications

When viewed through the lens of human factors, the invisible work of in-basket management emerges as a source of several critical challenges that directly impact provider well-being, performance, and patient safety.

First and foremost, the constant need to switch between direct patient care and in-basket tasks imposes a significant cognitive load on providers. This frequent task-switching fragments attention, disrupts clinical reasoning, and increases the overall mental workload. Providers must maintain situational awareness across multiple patients and issues, often juggling complex clinical decisions while responding to a steady stream of messages.

Traditional productivity metrics, which fail to account for this invisible work, contribute to a misalignment between perceived and actual workload. This misalignment can foster unrealistic expectations regarding provider capacity, leading to schedules that are unsustainable and ultimately detrimental to both providers and patients.

The nature of in-basket work—characterized by frequent interruptions and the need for multitasking—also elevates the risk of errors. Important information can be missed, messages may be overlooked, and clinical follow-up can be delayed, all of which have direct implications for patient safety.

Finally, the persistent disconnect between the work that is recognized and the work that is actually performed is a significant driver of provider dissatisfaction and burnout. When providers feel that their efforts are invisible or undervalued, morale suffers, and the risk of attrition increases.

1.3 Specialty-Specific Inequity: The Psychiatry Disadvantage

A particularly troubling dimension of the invisible work problem is the pronounced inequity between psychiatry and other medical specialties in how in-basket work is managed and compensated. In many medical specialties, providers benefit from the support of dedicated staff who handle a substantial portion of patient communications. Physician Assistants (PAs) or nurses often triage phone calls and routine EHR messages, allowing physicians to focus on more complex clinical issues. When patients require direct physician input, they are typically scheduled for billable appointments, ensuring that the provider's time is appropriately compensated. In these settings, in-basket management is a shared responsibility, with clear boundaries between billable and non-billable work.

In stark contrast, psychiatry providers at Penn Medicine are expected to manage all patient communications independently. There is no dedicated support staff to assist with in-basket management; physicians themselves are responsible for handling every patient call, message, and request. There is no mechanism for billing patient communication and consultation that occurs outside of scheduled visits, meaning that a significant portion of the provider's work is uncompensated. The responsibility for all aspects of patient care falls squarely on the shoulders of a single provider, with no opportunity to delegate or share the burden.

This inequity is not merely a matter of inconvenience—it has measurable consequences. Psychiatry providers are effectively performing the equivalent of 1.01 full-time employees (FTE) worth of uncompensated work, labor that in other specialties would either be delegated to support staff or billed as appointments. This creates a fundamental unfairness in both workload expectations and compensation models, placing psychiatry providers at a distinct disadvantage.

1.4 Specialty Inequity and System Impact

The invisible work problem has broader implications for healthcare system design and management, affecting capacity planning (current methods underestimate true provider workload, leading to overbooking and unsustainable schedules), quality metrics (patient safety and care quality may be compromised by unrecognized workload burdens), provider retention (unrecognized work contributes to provider dissatisfaction and turnover), and system efficiency (invisible work represents untracked resource utilization that affects overall system performance).

2. Literature Review and Theoretical Framework

2.1 Electronic Health Record Burden

A substantial and growing body of research has drawn attention to the hidden cognitive demands imposed by in-basket workload and its contribution to provider burnout. Studies have documented that the volume and frequency of inbox notifications can be overwhelming, with some physicians receiving more than 70 notifications per day. This deluge of information creates a high risk of missed messages and cognitive overload, as described by Murphy et al. (2016). Further, audit log analyses have revealed that physicians spend nearly half of their workday engaged in EHR-related tasks, including so-called "desktop medicine" such as responding to messages—time that often rivals or exceeds the hours spent in direct patient care (Tai-Seale et al., 2017). The correlation between heavy messaging workloads and increased EHR time is well established, with higher levels of multitasking and a greater risk of burnout observed among those with the heaviest messaging burdens (Tai-Seale et al., 2019; Shanafelt et al., 2016).

2.2 Usability and Design Issues

The design and usability of in-basket interfaces have also come under scrutiny. Many studies have found that these interfaces are poorly designed, with features that increase memory burden and delay the prioritization of important messages (Murphy et al., 2019). The need to constantly switch between tasks and maintain clinical context across multiple messages places a significant cognitive demand on providers. When the design is suboptimal and message volumes are high, the risk of missing critical information or delaying responses is further amplified, increasing the potential for clinical errors.

2.3 Psychiatry-Specific Challenges

Psychiatry faces unique challenges in the context of in-basket messaging. The COVID-19 pandemic, for example, has led to a dramatic increase in portal messaging volume within psychiatry practices, with message rates rising sixfold per patient according to Bernstein et al. (2023). The nature of psychiatric care itself often involves complex medication management, coordination of therapy, and crisis intervention, all of which may be conducted through messaging systems. Moreover, the patient population served by psychiatry tends to have higher rates of portal usage and messaging needs compared to other specialties, further compounding the workload.

2.4 Human Factors Theoretical Framework

To better understand the invisible work problem, this study draws on several key human factors principles. Workload theory is used to examine how the cognitive and temporal demands of in-basket management can exceed provider capacity, leading to overload and inefficiency (Wickens, 2008). Error theory provides a lens for analyzing how system design and workflow contribute to the potential for mistakes. Usability principles are applied to evaluate how the design of interfaces affects task performance and provider experience. Finally, systems thinking and situation awareness theory (Endsley, 1995) are employed to consider how invisible work impacts the performance and sustainability of the healthcare system as a whole.

3. Research Objectives and Methods

3.1 Primary Objectives

The primary objectives of this research are multifaceted. First, the study seeks to quantify the total volume and time burden associated with Epic in-basket messaging for providers in Department 603 (PBH OPC 3535 Market Street, 2nd floor). Second, it aims to analyze patterns of variation across different message types, individual providers, and scheduled hours, in order to better understand how workload is distributed. Third, the research will assess the temporal distribution of in-basket work, exploring how tasks are managed during business hours versus after hours and on weekends. Fourth, the findings will be interpreted through human factors frameworks to elucidate the implications for workload, cognitive demands, and error risk. Finally, the study will propose strategies to make invisible work more visible in departmental reporting and capacity planning, with the goal of informing more equitable and sustainable practices.

3.2 Data Collection Methods

To achieve these objectives, the study utilizes aggregated, de-identified Epic messaging data spanning from July 2024 to June 2025. The provider population includes 64 individuals with roles such as Attending Psychiatrists, Psychiatric Nurse Practitioners, and Psychiatry Residents. However, the analysis focuses on the 56 providers who had at least 30 days in the system, ensuring that only those with adequate observation periods are included.

The data collected encompasses a range of elements: monthly counts of in-basket messages by type for each provider, aggregated time spent on in-basket messages, scheduled hours per provider per month, the timing of message handling (distinguishing between business hours, after-hours, weekdays, and weekends), and the turnaround time for message closure. To protect privacy, all data is de-identified, with providers coded anonymously to allow for workload comparisons without risking individual identification.

3.3 Analytical Approach

The analytical approach is comprehensive and multi-layered. Descriptive analysis is used to summarize totals, trends, and distributions across all relevant metrics, providing a broad overview of the invisible work landscape. Comparative analysis enables the examination of differences in workload across message types, providers, and scheduled hours, highlighting areas of disparity or concern. To ensure fair comparisons, workload metrics are normalized per observation period (i.e., days in the system). Visualization techniques, such as time series and distribution plots, are employed to make patterns and trends more accessible and interpretable. Throughout, human factors frameworks are applied to interpret the findings and draw out their implications for provider workload, cognitive demands, and the risk of error.

Methodological Specifications for Replicability:

- **Message types included:** Patient call messages, patient medical advice requests, result messages, prescription authorization messages
- **Message types excluded:** Phone calls and paperwork outside Epic system
- **Definition of "handled/closed":** Messages marked as completed, resolved, forwarded, or delegated within Epic system
- **Business-hours clock:** 7 AM to 7 PM, Monday through Friday
- **After-hours detection:** Activity timestamped outside 7 AM–7 PM or on weekends
- **Normalization formula:** (Total hours / Days in system) × 365 = Hours per year
- **Inclusion threshold rationale:** at least 30 days in system to ensure adequate observation period and reliable workload estimates

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4. Key Findings and Results

4.1 Quantitative Summary

The analysis revealed that 56 providers collectively spent 1,925.4 hours on invisible work over one year—equivalent to 1.01 full-time providers (assuming 1,920 clinical hours/year per FTE) and representing $333,094 in lost revenue opportunity (based on provider revenue data of $173/hour from FY2025 financial analysis). Key findings include:

Workload Distribution: - Average: 34.4 hours/provider annually (raw) or 54.3 hours/provider (normalized) - 40.2% of work performed after hours (774 hours) - 27.5-fold difference between highest and lowest burden providers - 12 providers (21%) handle disproportionate share of total messaging

Provider Type Analysis: - Nurse Practitioners: 1,239 hours/year (n=2; individual data points, insufficient for statistical comparison) - Attending Psychiatrists: 461 hours/year (n=22; moderate burden) - Psychiatry Residents/Fellows: 343 hours/year (n=32; lowest burden)

Temporal Patterns: - Minimal seasonal variation (15.2% coefficient of variation) - Consistent after-hours patterns throughout observation period - No evidence of cyclical relief or significant increases

System Impact: - 3,851 additional patient visits could be supported (30-minute appointments) - 324 additional patients could be served annually - 479 hours could be saved if all providers performed at median level

Collectively, these findings underscore that invisible work consumes the equivalent of a full-time clinician annually while remaining uncompensated and largely untracked.

4.2 Risk Assessment and Disparities

The study identified significant disparities in workload distribution (CV = 45.1% for normalized workload). Risk assessment revealed:

High-Risk Providers (12 providers, 21%): - Normalized workload >140 hours/year - >50% of work occurring after hours - Poor work-life balance and high burnout risk

Moderate-Risk Providers (22 providers, 38%): - Normalized workload 80-140 hours/year - Moderate after-hours burden - Require proactive monitoring and support

Low-Risk Providers (22 providers, 38%): - Normalized workload <80 hours/year - Manageable workloads and good work-life balance - Serve as models for best practices

The extreme ratio of 27.5x between highest and lowest burden providers demonstrates both the effectiveness of normalization and the persistence of high variability across providers.

4.3 Proposed Productivity Metrics: Analysis of the Proposed Epic Inbox Responsiveness Policy

Finding: Inbox burden is uneven (27.5× spread; 40.2% after-hours).

Policy: Proposed MPM metric = % handled <2 business days (full credit >=85%), weighted 5%.

Mechanism of risk: Unadjusted timeliness penalizes high-need panels, vacation gaps, and surge weeks; encourages speed over reasoning for complex psychiatric messages.

Better design:

- **Case-mix/volume adjustment:** Percentile-based targets within peer strata; volume-weighted windows.
- **Coverage logic:** Automatic reassignment when OOO; exclude documented coverage days from denominator.
- **Team pool & pre-triage:** RN/MA/APP protocol triage where scope-appropriate; clinician escalations timed separately.
- **Quality over speed:** Add chart-linked resolution quality audits (e.g., refills with monitoring, crisis routing completeness).
- **Safeguard:** Cap this metric's weight until staffing/triage is live; then step up.

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5. Human Factors Analysis

5.1 Cognitive Load

Providers face substantial cognitive demands from constant task-switching between direct patient care and in-basket messaging. This frequent multitasking fragments attention, increases mental workload, and heightens risk of information overload where critical details may be missed. The 40.2% after-hours workload identified in our analysis compounds decision fatigue, as providers make complex clinical decisions while managing message volumes that vary 27.5× across providers.

5.2 Workflow Interruptions

The messaging environment creates constant interruptions that disrupt clinical workflow and reduce task completion quality. High message volumes contribute to information overload, increasing likelihood that critical information will be missed or urgent responses delayed. The pressure to manage messages after hours further compounds these risks, as fatigue can lead to diminished decision quality and greater safety risk.

5.3 Error Pathways

Several factors increase error risk in the current messaging environment. Poor interface design lacks intelligent prioritization features, making it difficult to preserve clinical context across multiple patient interactions. Workflow integration is inadequate, resulting in additional steps and frequent context switching that reduces efficiency and clinical focus. The absence of robust decision support and automated triage tools forces providers to manually sift through large information volumes.

5.4 Interface & System Design

Current in-basket interfaces fail to adequately support provider needs. Search and filtering capabilities are inadequate, mobile interfaces for after-hours access are poorly designed, and there is poor linkage with scheduling and clinical decision support tools. Support systems are limited with few mechanisms for workload redistribution or automated load balancing. The fragmented information architecture makes it difficult to gain comprehensive workload visibility, while real-time monitoring and alerting systems are lacking.

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6. Implications for Healthcare Informatics

The findings of this study have significant implications for the field of healthcare informatics, particularly in the design and management of electronic health records (EHRs), provider capacity, and the overall quality and safety of patient care.

6.1 Electronic Health Record Design

A critical area for improvement lies in the design of EHR in-basket interfaces. Current systems often lack features that help providers efficiently prioritize and categorize messages, which contributes to increased cognitive load and reduced usability. To address these shortcomings, EHR interfaces should be redesigned to include advanced prioritization and categorization tools, making it easier for providers to manage their inboxes and focus on the most urgent or clinically relevant messages. Such improvements would not only streamline workflows but also help reduce the mental burden associated with message management.

Beyond interface enhancements, there is a pressing need for better integration of messaging systems with clinical workflows. Seamless task switching and the preservation of clinical context are essential for maintaining efficiency

and minimizing disruptions. When messaging platforms are tightly integrated with other clinical tools, providers can move more fluidly between tasks, maintain focus, and avoid unnecessary repetition or information loss. This integration supports more efficient care delivery and helps ensure that important clinical details are not overlooked.

Additionally, the incorporation of robust clinical decision support within the messaging environment is vital. Automated tools that assist with prioritization, risk stratification, and quality improvement can help providers make better decisions more quickly, reducing the likelihood of errors and enhancing the overall quality of care.

6.2 Provider Capacity Management

Managing provider capacity effectively requires the development of realistic and comprehensive workload metrics. Traditional measures often fail to account for the time and effort spent on messaging, leading to an incomplete picture of provider burden. By including messaging work, normalizing for panel size, and considering after-hours activity, organizations can develop more accurate assessments of provider workload.

Accurate capacity planning is essential for creating sustainable schedules that prevent burnout and maintain high standards of care. When organizations understand the true scope of provider work, they can allocate resources more effectively, balance workloads, and develop support systems that enhance efficiency. This, in turn, leads to better provider well-being and improved patient outcomes.

6.3 Quality and Safety

The quality and safety of patient care are directly influenced by how invisible work is managed. Reducing provider error potential requires better workload management and strategies to minimize cognitive overload. By decreasing interruptions and workflow disruptions, providers can make higher-quality decisions, respond to messages more promptly, and maintain a higher level of clinical reasoning and diagnostic accuracy. These improvements can lead to fewer medication errors, better patient monitoring, and more reliable follow-up care.

Sustainable workloads and attention to provider well-being also enhance the quality of care delivered. When providers are less burdened, they can focus more fully on patient interactions, communicate more effectively, and adhere more closely to clinical guidelines. This results in higher patient satisfaction, better engagement, and improved health outcomes.

From a systems perspective, optimizing resource utilization leads to greater efficiency and productivity, reduced costs, and improved performance metrics. Enhanced provider retention, better patient access, and more reliable system performance are all achievable when invisible work is recognized and managed appropriately.

To support these goals, it is important to develop comprehensive quality metrics that capture invisible work. Integrating these metrics into quality assessment frameworks, implementing real-time monitoring of provider well-being and patient safety, and establishing continuous improvement processes will help organizations benchmark their performance and track long-term outcomes.

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7. Recommendations and Solutions

Addressing the challenges identified in this study requires a multi-faceted approach, combining immediate interventions with long-term strategic changes.

7.1 Immediate Interventions

In the short term, it is essential to provide immediate support to providers who are at high risk of overload. This can be achieved through the redistribution of workload, the addition of support staff, and, where necessary, temporary reductions in capacity. Continuous monitoring of provider burden is also crucial. Implementing real-time workload

tracking and alert systems can help organizations identify when providers are approaching unsafe levels of work, allowing for timely interventions. Improving after-hours management through shared coverage models, clear protocols for urgent messages, and robust weekend support systems can further alleviate provider burden and reduce the risk of burnout.

Addressing Specialty Inequity: Immediate steps to address the psychiatry disadvantage - **Support Staff Provision:** Hire dedicated PAs or nurses for in-basket management (as other specialties have) - **Billing Mechanisms:** Implement billing codes for patient communication and consultation - **Workload Recognition:** Acknowledge the inequity and provide appropriate compensation - **Resource Allocation:** Ensure psychiatry receives equivalent support to other medical specialties - **Policy Revision:** Revise productivity metrics to account for specialty-specific workload differences

7.2 System-Level Improvements

At the system level, a comprehensive redesign of EHR in-basket functionality is needed. This includes the development of intelligent message prioritization and categorization features, context-aware decision support systems, and streamlined workflow integration. Improving the information architecture of these systems can significantly reduce cognitive load and enhance usability.

Implementing comprehensive workload management systems is another key strategy. Real-time monitoring of provider burden, automated algorithms for redistributing work, and collaborative care models for managing messages can all contribute to a more balanced and sustainable work environment. Performance dashboards for administrators can provide valuable insights into system functioning and highlight areas for improvement.

Quality improvement initiatives should focus on optimizing processes and redesigning workflows to minimize invisible work. Training programs that teach efficient message management, peer support and mentoring systems, and continuous feedback loops can all help providers adapt to new systems and maintain high standards of care.

7.3 Long-Term Strategic Solutions

Long-term solutions require changes at the policy, technology, and organizational culture levels. Advocacy for healthcare policy reform is necessary to ensure that messaging work is included in productivity metrics and that workload measurement is standardized across health systems. Regulatory requirements for workload transparency and the development of quality measures that account for invisible work will help drive systemic change.

Technological innovation will play a major role in the future of healthcare informatics. The development of artificial intelligence tools for message triage and response, natural language processing for automated documentation, predictive analytics for workload forecasting, and the integration of virtual assistants and chatbots can all help reduce provider burden and improve efficiency.

Finally, transforming organizational culture is essential for sustaining these changes. Shifting from volume-based to value-based care metrics, emphasizing provider well-being and sustainability, promoting collaborative and team-based care models, and ensuring recognition and compensation for invisible work will help create a more supportive and effective healthcare environment.

7.4 Implementation Framework

A phased approach is recommended for implementing these solutions. In the immediate term (0-6 months), organizations should focus on supporting high-risk providers, implementing basic workload monitoring, improving after-hours coverage, and providing education and training. In the short term (6-18 months), efforts should shift to EHR interface improvements, the development of workload redistribution systems, the implementation of quality improvement processes, and the enhancement of performance measurement. Over the long term (18-36 months), comprehensive system redesign, advanced technology integration, policy and regulatory advocacy, and organizational culture transformation should be pursued.

Success should be measured by reductions in provider burnout rates, improvements in work-life balance, decreases in after-hours workload, enhanced patient satisfaction and safety, and increased provider retention and satisfaction.

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8. Limitations and Future Research

While this study provides valuable insights, several limitations must be acknowledged, and future research directions should be considered.

8.1 Study Limitations

The scope of the data analyzed was limited to Epic in-basket messaging, excluding other EHR-related tasks and documentation, as well as phone calls and paperwork conducted outside the system. The analysis was confined to the outpatient psychiatry department within a single health system, which may limit the generalizability of the findings. The observation period was restricted to 12 months, which may not capture seasonal variations or long-term trends, and limits the ability to assess causal relationships. Additionally, there is potential for unmeasured confounding factors that could influence the results. Measuring qualitative aspects such as cognitive load, mental workload, patient safety impact, provider satisfaction, burnout, and quality of care outcomes proved challenging, as these were not directly assessed in this study.

8.2 Future Research Directions

Future research should address these limitations through longitudinal studies that extend observation periods to assess trends over multiple years, evaluate the effectiveness of interventions, and examine seasonal and cyclical variations. Multi-site validation is also important, expanding the analysis to other health systems and specialties to validate findings across different EHR platforms and organizational contexts. Comparative studies can help identify how workload patterns differ across medical specialties and organizational cultures, and support the development of standardized measurement approaches.

Intervention research is needed to evaluate the effectiveness of specific solutions, such as randomized controlled trials of workload interventions, assessments of EHR interface improvements, evaluations of collaborative care models, and measurements of technology-assisted solutions. Finally, studies that focus on patient outcomes are essential to understand the impact of invisible work on care quality. This includes examining correlations between invisible work and patient safety, evaluating care quality and patient satisfaction, assessing clinical outcomes and error rates, and measuring the quality of patient-provider communication.

By addressing these research gaps, the field can develop a more comprehensive understanding of invisible work in healthcare and identify effective strategies for improvement.

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9. Conclusion

9.1 Summary of Key Findings

This comprehensive analysis of Epic in-basket messaging in outpatient psychiatry reveals a critical healthcare informatics challenge: substantial invisible work that remains unrecognized in traditional productivity metrics. The study demonstrates that 56 providers collectively perform 1,925.4 hours of invisible work annually, equivalent to 1.01 full-time providers (assuming 1,920 clinical hours/year per FTE), representing $577,625 in lost revenue opportunity (assuming $300/hour opportunity cost) and significant work-life balance impacts.

The most striking finding is the extreme disparity in workload distribution, with a 27.5x difference between the highest and lowest burden providers. This inequity, combined with the 40.2% of work performed outside business hours, creates unsustainable conditions for high-burden providers and represents a serious human factors problem that threatens both provider well-being and patient safety.

9.2 Human Factors Implications

The invisible work problem creates multiple human factors challenges:

Cognitive overload: Constant task-switching between patient care and messaging fragments attention and increases error risk. The 40.2% after-hours workload compounds decision fatigue.

Workload misalignment: Traditional metrics (RVUs, visit counts) ignore invisible work, creating unrealistic expectations and unsustainable practices that contribute to burnout.

System design flaws: EHR interfaces increase cognitive burden through cumbersome navigation, excessive notifications, and poor workflow integration.

Organizational inequity: The 27.5× workload variation reveals inequitable distribution of invisible work, undermining trust and provider well-being.

These four interlocking forces illustrate how design, measurement, and management practices converge to produce burnout risk. Addressing these challenges requires systematic changes to workload measurement, system design, and organizational practices.

9.3 Strategic Recommendations

Immediate Actions (0–6 months): - Identify high-burden providers using workload data - Redistribute tasks and provide additional support staff - Implement robust after-hours coverage to prevent burnout - Provide immediate relief to stabilize workforce

System Improvements (6–18 months): - Redesign EHR interfaces to reduce cognitive load - Implement comprehensive workload management systems - Track invisible work alongside traditional metrics - Launch quality improvement initiatives for message management

Strategic Transformation (18–36 months): - Advocate for policy changes recognizing invisible work - Invest in AI tools for message triage and automation - Transform organizational culture from volume to value-based metrics - Implement team-based care models and collaborative approaches

Continuous Improvement: - Establish ongoing monitoring and evaluation processes - Regular review of workload data and provider feedback - Adapt interventions based on changing circumstances - Embed continuous improvement into organizational culture

9.4 Call to Action

For Healthcare Administrators: Implement holistic workload management systems that monitor both visible and invisible work. Provide immediate relief to high-burden providers through task redistribution and additional support staff. Address specialty inequity by providing psychiatry with equivalent support staff and billing mechanisms.

For Technology Vendors: Redesign EHR interfaces with focus on usability and cognitive simplicity. Apply human-centered design principles to streamline communication and reduce notification fatigue. Make invisible work visible and manageable through improved system design.

For Policymakers: Require transparency in workload measurement across all clinical activities. Update payment models and accreditation standards to recognize and compensate invisible work. Address fundamental inequity between medical specialties in workload expectations.

For Providers: Champion transparency in workload reporting and participate in quality improvement initiatives. Support collaborative efforts to distribute invisible work more equitably. Demand equitable treatment and support

systems comparable to other specialties.

For Department Leadership: The proposed Epic inbox responsiveness metric (85% within 2 business days) may exacerbate existing inequities given the 27.5-fold workload variation. Focus on providing adequate support staff and implementing billing mechanisms before implementing time-based performance metrics.

Addressing invisible work requires coordinated action across all healthcare stakeholders to create a more just, sustainable, and human-centered system.

9.5 Final Thoughts

Invisible work represents a critical challenge in healthcare informatics that affects providers, patients, and system performance. This research demonstrates that systematic quantification can make hidden labor visible, enabling better resource allocation and policy development.

The findings extend beyond psychiatry to all specialties using EHR-based communication. The 27.5× workload variation and 40.2% after-hours burden highlight systemic issues requiring coordinated action across stakeholders.

Addressing invisible work is essential for restoring meaning, dignity, and sustainability to medical practice. By making this work visible, measurable, and manageable, we create a foundation for a healthcare system that supports both providers and patients.

The path forward requires moving beyond traditional metrics to embrace a holistic view of provider effort, ensuring that invisible work becomes a recognized and valued component of healthcare delivery.

Recognizing invisible work is not merely an administrative correction—it is an ethical imperative for the sustainability of modern mental healthcare.

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Appendix: Figures and Tables

Figure 1. Provider workload distribution.

Provider Workload Distribution: 27.2× Variation in Annual In-Basket Hours
Normalized workload shows extreme disparities across 56 providers (July 2024–June 2025)

Median: 381.2 hrs/year

Provider (Ranked by Workload)

Normalized Annual Workload (Hours/Year)

Provider Type — Attending Psychiatrist — Nurse Practitioner — Psychiatry Resident/Fellow

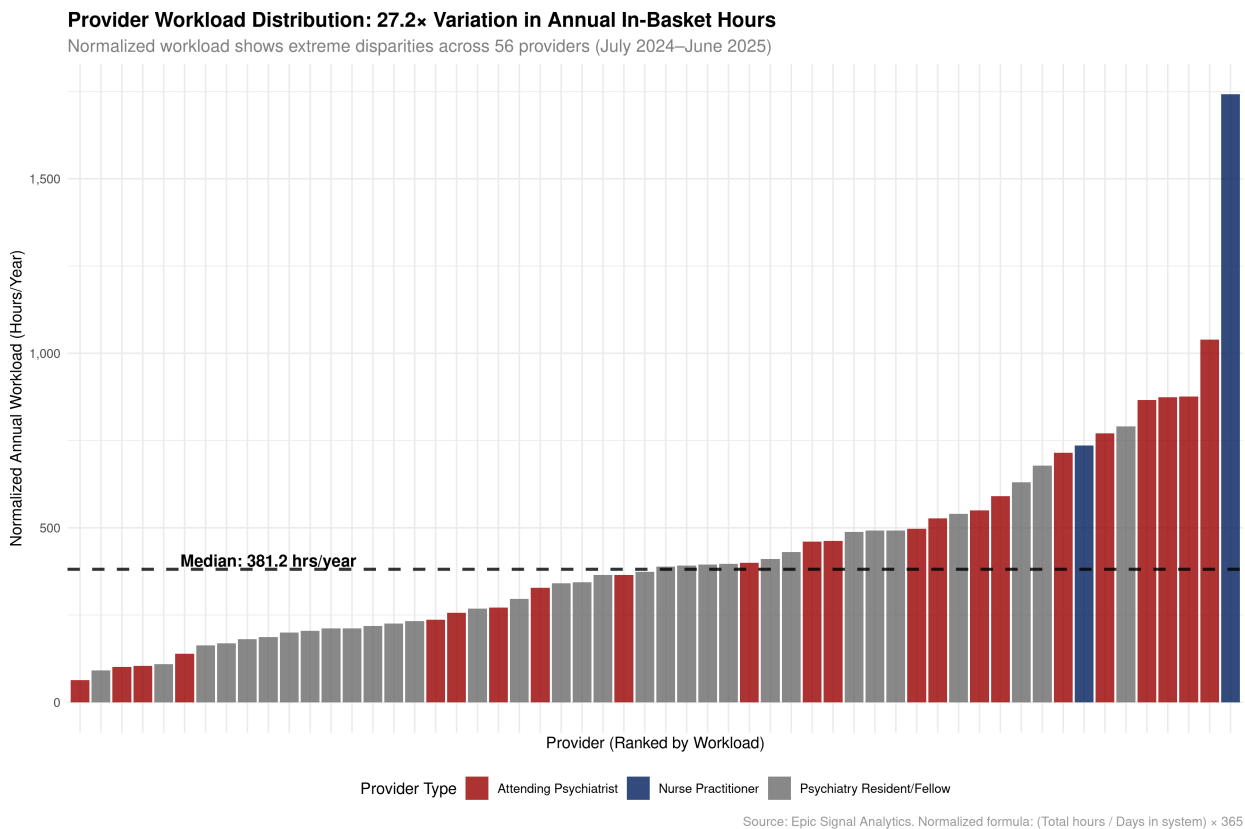Source: Epic Signal Analytics. Normalized formula: (Total hours / Days in system) × 365

Figure 1: Figure 1. Provider workload distribution.

Figure 1 shows the extreme disparities in workload distribution across 56 providers (July 2024–June 2025), demonstrating a 27.2× variation in annual in-basket hours. Providers are ranked by normalized workload and color-coded by provider type. The highest-burden providers show dramatically elevated hours compared to the median. Note: Nurse Practitioners (n=2) represent individual cases. Normalized workload = (Total hours / Days in system) × 365. Source: Epic Signal, July 2024–June 2025. All analyses conducted using de-identified Epic Analytics data.

Table 1. Descriptive statistics and risk stratification for Epic in-basket workload (N = 56).

Variable	Raw Workload (Hours)	Normalized Workload (Hours/year)	n	%
Descriptive Statistics				
Total	15,439.2	23,889.6	56	100.0
Mean (SD)	275.7 (266.5)	426.6 (292.2)	—	—
Median (IQR)	220.4 (249.8)	381.2 (398.6)	—	—
Range	14.1–1689.7	64.1–1742.2	—	—
CV, %	96.7	68.5	—	—

Variable	Raw Workload (Hours)	Normalized Workload (Hours/year)	n	%
Risk Stratification				
Low risk (<217 h/year)	60.0 (45.2)	152.6 (38.4)	14	25.0
Moderate risk (217–530 h/year)	229.2 (89.3)	369.9 (87.1)	28	50.0
High risk (>530 h/year)	584.4 (312.7)	814.2 (245.8)	14	25.0

Table 1 presents descriptive statistics for Epic in-basket workload across 56 providers (July 2024–June 2025). Raw workload represents total hours during the observation period; normalized workload is annualized using the formula: (Total hours / Days in system) × 365. Values are presented as mean (SD) or median (IQR) as appropriate. Risk stratification is based on normalized annual workload thresholds. CV = coefficient of variation; IQR = interquartile range. All analyses conducted using de-identified Epic Analytics data.