Public Sector Management Practice and Employee Well-being

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This draft: December 2025

Working paper: comments welcome

Abstract

This paper examines how management practices influence mental health outcomes, combining management surveys, prescription drug records, and employment records in Danish administrative data. Management practices benefit workers uniformly in the private sector but disproportionately benefit high-ability workers in the public sector, who exhibit significantly greater sensitivity to management quality. Decomposing management practices reveals that incentive systems and performance monitoring drive these effects. Organizations with stronger incentive and monitoring practices systematically attract and retain higher-quality workers, creating environments where high-ability employees thrive—either through improved working conditions or better worker-organization matching. These findings advance understanding of how management practices affect employee mental health beyond productivity. The results have particularly important implications for public sector organizations in which effective management is critical for retaining talented workers who accept wage penalties for mission-driven work.

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1 Introduction

It has been broadly documented that effective management practices contribute to organizational productivity both in the private and public sectors. Structured management systems, formal processes for goal-setting, performance monitoring, and personnel management, enable organizations to build higher-quality workforces and operate more efficiently. The productivity gains from structured management practices are well-documented across private (Syverson, 2011; Bloom and Van Reenen, 2010; Bloom et al., 2013) and the public sector (Scur et al., 2024; Lemos et al., 2024; Bloom et al., 2015; McNally et al., 2024).

This paper investigates a closely related yet unanswered question: how do management practices impact employee well-being? While the influence of management on organizational productivity has been extensively studied, much less is known about how managers affect employee mental and emotional health. The existing evidence is mixed. Dahl and Pierce (2020) find that performance-based pay systems, a common managerial practice, can have unintended negative consequences, leading to a 4-6% increase in antidepressant and anti-anxiety medication use among employees. In contrast, recent research (Gosnell et al., 2020) finds a positive association between improved management practices and increased worker satisfaction.

Understanding this relationship is increasingly urgent. At any point in time, approximately one in five working-age adults experiences a mental health condition (OECD, 2021). The economic costs are substantial: the World Health Organization (WHO) estimates that depression and anxiety cost the global economy approximately US$2.5 trillion in 2010 in lost productivity (WHO, 2022), while the OECD estimates the total cost of mental ill-health at over 4% of GDP across member countries, including reduced productivity, increased absenteeism, social spending, and health care expenditures (OECD, 2021). Given these costs, understanding how management practices affect employee mental health has significant economic and social implications. The opposing evidence on management practices is particularly concerning given the potential for managerial systems to inadvertently exacerbate workplace stress or, conversely, to serve as a protective factor when implemented thoughtfully.

Resolving this puzzle has important implications for all organizations, but is particularly critical within the public sector. Public sector employees often enter their careers with high intrinsic motivation to serve, yet face distinctive workplace challenges, including resource constraints and high emotional labor demands. Understanding how management practices shape mental health outcomes in this context can inform evidence-based strategies to create workplaces that sustain both productivity and well-being while preserving the public service

ethos that attracted employees in the first place.

This paper aims to bridge the gap in understanding how management practices influence employee well-being, with a particular focus on mental health outcomes. We conducted a large-scale management survey of Danish organizations, surveying CEOs in the private sector and senior managers in the public sector using the World Management Survey (WMS) methodology. We have assembled a detailed dataset linking these management practice scores to comprehensive Danish administrative registers, which provide complete employment histories and objectively measured mental health outcomes through prescription drug use for antidepressants and anti-anxiety medications. This unique data allows us to analyze how management quality affects worker mental health and whether this relationship varies with worker ability. By comparing private and public sector organizations, we assess whether the relationship between management practices and mental health differs across sectors that vary fundamentally in their organizational objectives and employee motivations.

The data allows us to document some stylized facts. First, mental health medication usage is much higher in the public sector, consistent with prior evidence of elevated stress and burnout among public servants. Within sectors, usage is highest in healthcare for the public sector and manufacturing for the private sector. There is significant variation in both mental health drug usage and management practices even within narrowly defined industries.

Second, we show that management practices are strongly associated with reduced mental health drug usage across both sectors, even after controlling for industry. A one-unit increase (from 0 to 1) in management quality is associated with a 14% reduction in mental health drug usage in the public sector and a 10% reduction in the private sector. The effects are most pronounced for antidepressants (10% reduction in the public sector, 6% reduction in the private sector) and less so for anxiety medications.

Examining effects by worker ability reveals substantial heterogeneity beneath these average estimates. In the private sector, management improvements benefit workers uniformly across ability levels—both high- and low-ability workers experience similar reductions in mental drug usage as management quality improves. In stark contrast, the public sector exhibits pronounced ability-based heterogeneity. While management quality has modest effects on lower-ability workers, high-ability workers in the top quartile exhibit a stronger negative correlation between management quality and drug usage. Consequently, the difference in mental health drug usage between high- and low-ability workers is substantially larger in well-managed public sector organizations than in poorly-managed organizations.

Decomposing management practices reveals that incentive-based practices drive the strongest effects, reducing overall drug usage by 15% in the public sector and 9% in the private sector. Performance monitoring also shows significant benefits for high-ability public sector work-

ers, while target-setting practices exhibit negligible effects across both sectors. We provide suggestive evidence on potential mechanisms underlying these patterns. Analysis of worker sorting reveals that organizations with stronger incentive and performance monitoring practices systematically attract and retain higher-quality workers. These patterns suggest that incentive and performance monitoring practices foster environments where high-ability workers thrive, either by creating workplace conditions that support their success or by selecting workers well-suited to performance-oriented settings. This is particularly consequential for high-ability public sector employees, who accept substantial wage penalties to pursue mission-driven work and rely on effective management structures to realize the intrinsic rewards that motivated their career choice.

This study makes several contributions to the literature. First, it extends understanding of management's role beyond productivity to demonstrate substantial effects on worker mental health, contributing to recent debates about the welfare consequences of workplace practices (Dahl and Pierce, 2020; Gosnell et al., 2020). By combining comprehensive management surveys with objective prescription drug records for over 600,000 workers, we provide the first large-scale evidence on how structured management practices—monitoring, target-setting, and incentives—differentially affect mental health outcomes. Second, we document striking sectoral differences in how management quality interacts with worker ability to shape well-being. While private sector workers benefit uniformly from better management regardless of ability, high-ability public sector workers exhibit dramatically greater sensitivity to management quality. This asymmetry reveals fundamental differences in how organizational practices affect employee welfare across sectors with distinct objectives and compensation structures, extending literature on public service motivation (Vandenabeele, 2014) and public-private differences in management (Bloom et al., 2015).

The remainder of the paper is organized as follows: Section 2 provides institutional background on the Danish public sector, including its organizational structure, employment regulations, and workforce composition. Section 3 outlines the conceptual framework, discussing how management practices are expected to influence mental health and why these effects may differ across sectors and worker ability levels. Section 4 describes the data, including the management survey methodology, prescription drug records, and construction of key variables. Section 5 presents the empirical strategy and main results, highlighting sectoral differences and the role of worker ability in moderating the relationship between management quality and mental health outcomes. Section 6 concludes and discusses policy implications.

2 Institutional Background

The Danish public sector employs over 1 million workers, representing a substantial share of the total labor force. Public employment is concentrated in three main areas: health (50% of public sector employment), education (23%), and public administration (15%), with the remaining workers in smaller sectors including social services, public safety, and infrastructure . The public workforce is predominantly female (59%), compared to 31% in the private sector, reflecting the concentration of public employment in care-oriented and service professions. Public sector employees have, on average, higher levels of formal education than private sector workers, as indicated by higher school grade rankings (50.3 vs. 49.3 percentile) and higher worker ability measured by AKM fixed effects (52.4 vs. 59.6 percentile). Average annual wages in the public sector are approximately 361,000 kroner, compared to ... kroner in the private sector, consistent with well-documented public-private wage differentials for tertiary-educated workers.

The organization of Danish public services reflects the country's decentralized governance structure. Responsibility for service delivery is divided among the national government, five regions (*regioner*), and 98 municipalities (*kommuner*). The national government manages income support, unemployment insurance, and policy coordination. The five regions, created in a major structural reform in 2007, operate hospitals and specialized healthcare services. Municipalities provide core local services: childcare, primary and lower secondary education, elderly care, social services, and local infrastructure. This institutional structure generates substantial variation in organizational environments and management practices across public sector workplaces, as local governments retain some discretion over internal organization, resource allocation, and the design of incentives within nationally set frameworks. (Houlberg and Ejersbo, 2020)

Public sector managers operate within institutional constraints that shape their authority over personnel decisions. Denmark's civil service employment system provides job security protections, though these are less extensive than in many other European countries. Under the Tjenestemandslov (Civil Servants Act), permanent civil servants can be dismissed only for cause or following lengthy disciplinary procedures. However, since the 1990s, an increasing share of public employees are hired under collective agreements (overenskomstansatte) rather than as permanent civil servants, providing managers with some flexibility in staffing decisions. Research on public sector management demonstrates that even within highly regulated civil service systems, managers exercise substantial control over operational decisions, including task assignment, team structure, scheduling, and performance monitoring (Bloom et al., 2015; Rasul and Rogger, 2018).

Table 1 presents summary statistics for the public sector workforce and highlights considerable heterogeneity across sub-industries. Education workers exhibit the longest average tenure (7.2 years) and the highest ability levels, reflecting credential requirements and positive selection into teaching. Administrative workers have shorter tenures (6.3 years) and intermediate ability. Health sector employees display lower average ability measures and wages, driven primarily by the large share of workers employed in municipal nursing homes and residential care facilities, where educational requirements and compensation are lower than in regional hospitals.

3 Conceptual framework

Ambiguous theoretical predictions The theoretical relationship between management practices and employee mental health is ambiguous. On the one hand, well-structured management systems may alleviate workplace stress by reducing role ambiguity, facilitating efficient resource allocation, and providing clear feedback and recognition (Bloom et al., 2013; Hoque et al., 2023; Mohammad and Borkoski, 2024). On the other hand, the same practices may exacerbate mental health challenges: performance monitoring can induce anxiety through constant scrutiny, target setting may overwhelm employees, and formalization may reduce autonomy and intrinsic motivation. Consistent with this latter mechanism, Dahl and Pierce (2020) documents that pay-for-performance systems increase antidepressant and antianxiety medication use by 4–6%, highlighting that performance-oriented practices can impose substantial mental health costs.

Existing evidence has been largely fragmented and focused on specific incentive schemes, leaving little systematic evidence on the mental health consequences of general management practices. Existing theories admit both stress-reducing and stress-inducing channels, offering no clear prediction for the overall relationship. This ambiguity motivates our empirical analysis, which examines how overall management quality relates to employee mental health outcomes.

Public–private differences Management practices may have heterogeneous effects across sectors because public and private sector workers differ fundamentally in the sources of utility they derive from work, particularly the relative importance of intrinsic motivation versus monetary compensation. Figure **??** plots responses to the survey question, "To what extent is work important to you in addition to income?" across the ability distribution. Public sector workers (red line) consistently report higher intrinsic work importance than private sector workers (blue line). This pattern is consistent with selection on public

service motivation (Vandenabeele, 2014), whereby individuals choose public sector careers to contribute to societal goals rather than to maximize earnings. At the same time, there is evidence that the public sector also attracts workers for whom job security and income stability are particularly valuable. Civil service protections, predictable earnings paths, and lower exposure to dismissal risk make public sector employment comparatively attractive to more risk-averse individuals and workers with weaker outside options (Buurman et al., 2012; Pfeifer, 2011).

Compensation structures, however, differ sharply across sectors. Figure 2 shows that while ability strongly predicts wages in both sectors, the ability–wage gradient is substantially steeper in the private sector. High-ability public sector workers earn markedly less than observationally similar private sector workers, reflecting compressed wage schedules and limited scope for performance-based pay and promotion in government, education, and healthcare. As a result, high-ability public sector workers forgo substantial wage premiums in exchange for intrinsically meaningful work.

Taken together, these patterns imply asymmetric dependence on workplace conditions—and, in particular, management quality—for mental well-being. In well-managed organizations, clear objectives, adequate resources, and effective coordination enable employees to perform their tasks successfully. For public sector workers who selected into their roles for mission-driven reasons, effective management is essential for realizing the intrinsic rewards that motivated their career choice. This dependence is especially strong for high-ability public sector workers, for whom intrinsic fulfillment represents the primary return on substantial foregone earnings. In contrast, lower-ability workers who selected into the public sector primarily for job security depend less on achieving intrinsic fulfillment, making their well-being less sensitive to management quality. Conversely, poor management creates persistent dysfunction—such as unclear objectives, inadequate resources, excessive bureaucracy, and ineffective coordination—that hinders task completion and increases workplace strain.

Workers differ, however, in the extent to which such dysfunction can be buffered or offset within the organization. In the private sector, firms typically have greater flexibility in how work is organized and rewarded, allowing some scope to mitigate the consequences of poor management through task reallocation, informal adjustments, or compensation practices that help sustain worker well-being despite organizational frictions. In the public sector, institutional features such as fixed budgets, civil service regulations, and compressed wage schedules limit these adjustment margins. When management quality is low, public sector workers are therefore more exposed to persistent dysfunction in their daily work, increasing their reliance on effective management for mental well-being.

This limited flexibility is particularly consequential for high-ability public sector work-

ers. Having accepted substantial wage penalties to pursue mission-driven work, they depend critically on effective management to realize the intrinsic rewards that motivated their career choice. Poor management not only creates workplace dysfunction but also undermines the very purpose that drew them to public service, leaving them with neither financial compensation nor intrinsic fulfillment. These dynamics suggest that the relationship between management quality and mental health should be especially pronounced for high-ability public sector workers.

Heterogeneity across management practices Management quality encompasses distinct practices—including performance monitoring, target-setting, and incentive provision—that may affect employee well-being through different channels. In particular, incentive-related practices explicitly link performance to rewards or career consequences and may therefore be especially salient for high-ability workers, whose effort and productivity are most responsive to such alignment. By contrast, monitoring and target-setting practices primarily shape information and expectations and may have weaker or more context-dependent effects on mental health. Motivated by this distinction, we examine the relationship between mental health outcomes and each management dimension separately, and assess how these effects vary by worker ability and sector.

Empirical predictions Our conceptual framework motivates several empirical tests. First, we examine whether higher overall management quality is associated with lower mental health medication use in both the public and private sectors.

Second, we test whether the relationship between management quality and mental health varies systematically across sectors and worker ability. Specifically, we assess whether worker ability moderates the relationship between management quality and mental health more strongly in the public sector than in the private sector—consistent with the idea that high-ability public sector workers are particularly sensitive to management quality.

Finally, we investigate heterogeneity across management practices. Decomposing the overall management index into performance monitoring, target-setting, and incentive-related practices, we assess whether different management dimensions exhibit distinct relationships with mental health outcomes, and whether these relationships vary by worker ability and sector.

4 Data

This empirical research uses Danish administrative data, provided by Statistics Denmark. The Danish administrative system assigns each individual a unique personal identifier (CPR number), which enables precise linkage across multiple survey and administrative datasets. Through these identifiers, we obtain detailed information on CEO and employee characteristics, including gender, age, educational attainment, annual income, labor market experience, and occupational history.

Similarly, Denmark's firm-level administrative registers employ unique firm identification numbers (CVR numbers) that allow us to retrieve comprehensive information on workplace characteristics. These include workplace size (measured by number of employees), industry classification.

We integrate our management survey with multiple administrative registers covering medical prescriptions, employee absences, and workforce performance metrics, each explained below.

4.1 Management data

The Management and Organizational Practices Survey (MOPS) for the Danish public sector represents a comprehensive effort to systematically measure management quality and organizational practices across government institutions. This survey was developed as an extension of the original MOPS framework implemented in Denmark's private sector, building upon the structured management measurement methodology pioneered by Bloom et al. (2012) and subsequently adapted for the Danish context. The core measurement approach follows Bloom and Van Reenen's foundational work on quantifying management practices, which has been validated across numerous countries and organizational settings.

Data collection for the Danish public sector MOPS occurred in 2021. The survey frame was constructed using Denmark's workplace register RAS (Registerbaserede arbejdsstyrkestatistik), which provides a complete census of all public sector establishments with their workplace identifiers. The sampling included 9276 public sector workplaces employing 444,732 workers.

The survey included both a management questionnaire and an employee questionnaire to capture managerial perspectives and employee experiences within the same workplaces. This parallel measurement strategy allows us to validate managerial self-reports against employee perceptions and examine the alignment between intended and experienced practices. The management questionnaire was distributed electronically to the highest-ranking manager or administrator at each workplace, yielding a 30% response rate and 2,811 completed

workplace-level observations. To complement the managerial perspective, an employee survey was simultaneously administered at participating workplaces. For each workplace in the sampling frame, two employees were randomly selected from the complete employee roster using Statistics Denmark's employer-employee matched data (IDA database), ensuring representative coverage across different job functions, seniority levels, and demographic groups. We achieved an employee response rate of 59% at the workplace level, resulting in 10,297 completed employee surveys across 5,439 unique workplaces.

4.1.1 Measuring management

The survey contained 16 management questions and is divided into three subsections: monitoring, targets, and incentives.

The monitoring section contains four questions focusing on how establishments collect and utilize information to track and improve performance. These questions assess whether performance indicators are systematically monitored at the establishment, the breadth of monitoring as measured by the number of distinct indicators being tracked, and the frequency with which performance data are reviewed (daily, weekly, monthly, or less frequently). Additional items examine whether performance information is actively used to inform decision-making, shared with employees, and compared against benchmarks or historical trends. Collectively, these questions measure the extent to which management operates with reliable, timely information about organizational performance rather than relying on intuition or anecdotal evidence.

The targets section comprises three questions examining how establishments design and implement performance goals. Key dimensions include the time horizon over which targets are set (short-term versus long-term), whether targets are specific and measurable or vague and general, the appropriate level of difficulty (whether targets are realistic yet challenging), and the degree to which targets are clearly communicated and understood throughout the organization. This section also assesses whether performance targets are differentiated across units or individuals based on their specific circumstances, and whether there are systematic processes for reviewing and adjusting targets over time. These practices reflect the extent to which organizations translate broad strategic objectives into actionable, motivating goals that guide day-to-day work.

The incentives section contains nine questions exploring how establishments link performance to rewards and career outcomes. Questions cover both monetary incentives—including the prevalence and design of performance-based bonuses for managers and non-managerial staff, and the criteria used to determine bonus allocation—and non-monetary incentives such as promotion opportunities, recognition programs, and professional development in-

vestments. The section also examines practices for addressing underperformance, including whether low performers are identified, provided with improvement support, reassigned to more suitable roles, or ultimately dismissed if performance does not improve. Finally, questions assess whether high performers are systematically identified and retained through differentiated rewards or career advancement. These items measure whether the organization creates clear connections between individual contributions and consequences, a fundamental mechanism for motivating effort and attracting talent.

The complete survey instrument, including the exact wording and response options for all 16 management practice questions, is provided in Appendix A.

We aggregate responses across the 16 management practice questions to create a single management score. Following standard practice, we first normalize each question to range from 0 to 1, then calculate the unweighted average across all dimensions. The resulting composite score ranges from 0 to 1.

4.2 Prescription data

Our prescription data come from the Danish National Prescription Registry (Lægemiddelstatistikregistret), maintained by the Danish Health Data Authority (Sundhedsdatastyrelsen). This registry provides comprehensive, population-wide coverage of all pharmaceutical dispensations from community pharmacies in Denmark from 1994 onward. The registry's universal coverage stems from Denmark's national health insurance system, which reimburses pharmacies for filled prescriptions and consequently requires detailed transaction records for all dispensed medications. For every prescription filled at a Danish pharmacy for an individual with a CPR number, the register captures: the unique patient identifier (CPR number), the date of dispensation, complete medication information including the Anatomical Therapeutic Chemical (ATC) classification code, product name, active ingredient, strength, formulation, and package size.

This administrative data structure offers several critical advantages for research. First, unlike self-reported medication use in surveys, prescription registry data are based on actual pharmacy transactions and are free from recall bias—patients need not accurately remember which medications they took or when. Second, the data capture actual dispensation rather than merely prescriptions written, ensuring we observe medications that patients obtained (though we cannot directly observe consumption).

4.2.1 Measuring prescription intensity

To measure prescription intensity and enable meaningful comparisons across different medications, dosage strengths, and formulations, we construct our volume measures using the Defined Daily Dose (DDD) methodology established by the WHO Collaborating Centre for Drug Statistics Methodology. The DDD represents the assumed average maintenance dose per day for a drug used for its main indication in adults and serves as a standardization tool to enable drug utilization comparisons. For each medication, the WHO assigns a specific DDD value based on typical maintenance doses in clinical practice.

4.2.2 Constructing Mental Health Measures

Our analysis focuses on psychotropic medications used to treat stress, anxiety, and depression, which serve as quantifiable indicators of clinically significant mental health conditions in the workforce. We examine four categories of mental health medications: antidepressants, which treat depression and certain anxiety disorders; antipsychotic, used for severe mental health conditions including psychosis and bipolar disorder; sedatives, which reduce anxiety and promote sleep; and anxiolytics, specifically designed to treat anxiety disorders. [1] Our primary outcomes are the sum of all four medication categories, antidepressants alone, and anxiolytics alone, measured in defined daily doses (DDD) as described earlier. We focus separately on antidepressants and anxiolytics because they target the most common workplace-related mental health conditions—depression and anxiety—whereas antipsychotics and sedatives are typically prescribed for more severe conditions less directly linked to workplace stress.

4.3 Workforce data and Worker Quality

We obtain workforce data from Danish administrative registers IDAN, the employment data. It contains individual work spells with information on industry, sector, occupation, and position (allowing us to distinguish managers from non-managers).

We use the constructed work spell data to build a measure of worker quality. Following Abowd et al. (1999), we decompose the logarithmic wages into worker and firm-specific components and use estimated worker effects as the measure of "worker quality". We use 2010-2019 employment spell data, we restrict the data to jobs employing workers between the ages of 20 and 60. In any year, we associate each worker with the job where they were

[1] ATC codes defined by WHO are the following: Antidepressants N06A, Antipsychotics N05A, Sedatives N05C, Anxiolytics N05B.

employed longest. We estimate the following model:

$$\ln y_{it} = \alpha + x_{it}\beta + \psi_{J(i,t)} + \theta_i + \varepsilon_{it} \tag{1}$$

where the dependent variable, y_{it}, is the real log wage of worker i in year t. The function $J(i,t)$ indicates the workplace where i was employed in t. The $\psi_{J(i,t)}$ are workplace effects that reflect employer-specific wage premia. The θ_i are worker effects that capture the value of portable skills and represent our measure of worker quality. The controls in x_{it} include a normalized cubic in age interacted with gender along with year effects.

4.4 Workplace Outcomes and Productivity

To validate our management measures, we examine their relationship with organizational performance. In the private sector, we construct standard productivity measures from financial data: total factor productivity (TFP), value-added, net sales, gross profit, return on capital employed (ROCE), and debt ratio.[2] These measures capture different dimensions of firm performance and provide standard benchmarks for assessing management quality in private organizations.

Measuring productivity in the public sector presents greater challenges, as many public services lack market prices or clearly defined output measures. We focus on the education sector, where student achievement data enable construction of teacher value-added measures—the most widely validated productivity metric available for public sector organizations. Teacher value-added estimates the causal effect of individual teachers on student learning, net of student background characteristics and prior achievement (Chetty et al., 2014).

To construct these measures, we use ninth-grade exit examinations, which are standardized nationally and provide comparable performance metrics across schools. The student register links each student to their classroom and identifies the CPR number of each teacher, enabling us to track which teachers instruct which students. For each teacher, we estimate value-added based on student test score gains, controlling for prior achievement, student demographics, and school characteristics. This approach isolates the component of student learning attributable to teacher effectiveness, providing an objective measure of a key di-

[2]We estimate TFP following Wooldridge (2009) using value-added as output. Value added is calculated as turnover plus work performed on own account and other operating income, minus purchases of goods, raw materials, energy, hired labor, and various operating expenses. TFP is calculated by estimating the elasticities of labor and capital at the two-digit NACE industry level. Net sales equal turnover less returns and discounts. Gross profit equals net sales less cost of goods sold. ROCE is defined as operating profit divided by capital employed. The debt ratio is total liabilities divided by total assets.

mension of public sector productivity.[3]

We focus on education for several reasons. First, the student-teacher linkages and standardized test data enable rigorous productivity measurement that is not feasible in most other public sectors. Healthcare productivity, for instance, would require detailed patient outcome data and risk adjustment that are not available in our administrative registers. Second, education represents a substantial share (23%) of public sector employment, providing sufficient sample size for meaningful analysis. Third, the education literature has extensively validated teacher value-added as a measure of productivity (Chetty et al., 2014), providing confidence that our metric captures genuine differences in teacher effectiveness rather than selection or measurement artifacts.

4.5 Descriptive Statistics and Stylized Facts

4.5.1 Management Practice in the workplace

Table A1 highlights a strong correlation between management quality and productivity outcomes in private sector, consistent with existing management literature. This supports the validity of the survey in capturing key dimensions of organizational effectiveness. Table 1 shows that there is a significant relationship between management scores and various measures of financial productivity, including TFP, value-added, sales, profit, and return on capital employed (ROCE).

Management practices are also positively linked to productivity in the public sector, particularly in education, where the data is most comprehensive. Table A2 shows positive and statistically significant relationship between management scores and teacher value-added, an important measure of productivity in the education sector. These findings align with broader management literature, which emphasizes the role of structured management practices in driving productivity. The results from the education sector provide robust evidence of the importance of effective management in enhancing productivity of public sector in Denmark.

Health, education, and public administration together comprise the majority of public sector employment. Specifically, the health sector employs 53.23% of public sector workers, while education accounts for 21.56%, and public administration represents 17.38% of the workforce.

[3]Following standard practice in the education literature (Chetty et al., 2014), we estimate teacher value-added using a student-level regression of test scores on lagged test scores, student characteristics, and teacher fixed effects. The estimated teacher fixed effects represent value-added. We focus on ninth-grade examinations because these high-stakes tests have strong psychometric properties and less measurement error than lower-grade assessments.

Figure 3 illustrates the average management scores across various sectors and sub-sectors, with the number of workplaces in the sample (N) displayed inside the bars. The management score reflects the quality of workplace practices in areas such as monitoring, target-setting, and incentives.

The private sector has the highest representation in the sample with 4,359 workplaces and an average management score of 0.497 indicating relatively strong management practices compared to other sectors. Within the public sector, social care and hospitals exhibit the highest management score, nearing 0.372, which is notably higher than other sub-sectors such as residential care and childcare.

In education, primary schools have a much lower management score of 0.303, secondary schools have average management scores of 0.385, while higher education institutions score slightly higher at 0.396, reflecting a more structured management approach in universities. Public administration has the highest average management score in the public sector, with bureaucratic workplaces scoring 0.465, higher than public safety institutions.

These results indicate that the private sector tends to have stronger management practices overall and there is substantial variation in the public sector, with public administration scoring relatively high in management quality, followed by education and then the health sector.

4.5.2 Mental health in the workplace

The relationship between mental health and workplace conditions is well-documented in the literature. Poor mental health, often exacerbated by workplace stress, can reduce productivity, increase absenteeism, and lead to higher turnover rates. Stress is frequently cited as a significant driver of mental health challenges, with evidence showing that mismatched skills, excessive workloads, and low job control exacerbate mental health issues. However, workplaces that provide strong support structures, clear expectations, and intrinsic rewards can mitigate stress and promote psychological well-being.

Workplace mental health presents notable differences between the public and private sectors, both in the full universe of workers and in the focused sample. These differences highlight the distinct challenges faced by employees in each sector and underscore the importance of context-specific interventions to address mental health issues.

In the full population (Panel A), public sector workers exhibit higher rates of mental health drug use compared to private sector employees. The incidence of mental health drug use is 10.1% in the public sector, notably higher than the 6.3% observed in the private sector. Similarly, the average volume of mental health drugs prescribed is higher in the public sector, at approximately 7,949 doses per person per year, compared to 6,989 in the private sector.

This trend persists across specific types of medications: antidepressant use (both incidence and volume) and anxiety medication are more common among public sector employees.

The sample data (Panel B) reflects similar patterns, although the overall rates are slightly lower due to selection criteria. In this subset, public sector workers still report higher mental health drug incidence (9.3% compared to 5.4% in the private sector), and the average volume of medication use remains higher. This consistency between the full population and the sample indicates that the trends are not driven by sample selection but are instead a systemic feature of the public-private divide.

Within the public sector, there is substantial variation by sub-sector. Workers in education exhibit lower mental health drug use compared to other sub-sectors, with an antidepressant incidence rate of 6.1% and anxiety incidence of 3.5%. This may be attributed to the intrinsic motivation and fulfillment associated with teaching roles, as highlighted in the literature on motivation for public service. Conversely, health sector employees report the highest rates of mental health drug use, likely reflecting the emotional toll of caregiving, the high-stakes environment of healthcare delivery, and the higher availability of mental health-related drugs compared to other sectors. Additionally, the reduced stigma associated with seeking help and using mental health medication in the healthcare profession may contribute to these elevated rates. Administrative workers also face elevated rates, potentially due to bureaucratic pressures and workload stress.

5 Management Practice and Mental health

Our analysis relies on a regression framework to examine the relationship between management practices and employee mental health outcomes. The regression model is specified as:

$$\ln y_{it} = \alpha + \beta_M M + \beta_\theta \theta + \beta_{M\times\theta}(M \times \theta) + x_{it}\beta + \gamma_s + \varepsilon_{it} \tag{2}$$

In this specification, the dependent variable $\ln y_{it}$ represents the natural logarithm of the real dosage of mental health-related drugs taken by worker i in year t. The primary explanatory variable is M, the management score, which measures the quality of management practices at the worker's organization. The term $\beta_M M$ captures the direct effect of management practices on mental health outcomes, with β_M indicating how a one-unit increase in the management score influences the log dosage of mental health drugs. Similarly, θ represents worker ability, derived from the aforementioned AKM decomposition, which accounts for unobservable worker-specific traits such as productivity and skills. The term $\beta_\theta \theta$ reflects the

extent to which differences in worker ability affect mental health outcomes, independent of management practices.

To capture how the relationship between management practices and mental health varies by worker ability, the model includes an interaction term, $M \times \theta$. This term allows the effect of management practices to depend on worker ability. The coefficient $\beta_{M\times\theta}$ indicates whether worker ability amplifies or mitigates the impact of management on mental health outcomes. A positive coefficient would suggest that the effect of management on mental health is stronger for higher-ability workers, while a negative coefficient would indicate the opposite.

In addition, the model includes $x_{it}\beta$, a vector of control variables for worker characteristics, such as age, gender, and a college degree dummy. These controls account for observable individual-level differences that could confound the relationship between management practices and mental health. The fixed effects term, γ_s, captures unobservable, time-invariant industry-specific factors, such as structural stressors or workplace culture, ensuring that the effects of management practices are estimated within industries rather than across them. Lastly, the error term, ε_{it}, represents all other unobserved factors that might influence mental health drug usage but are not explicitly included in the model.

5.1 Management and mental health

Table 2 reports the effects of management quality and worker characteristics on the log of mental health drug usage for public sector employees. Columns (1)–(3) present baseline specifications without interaction terms, while columns (4)–(6) include an interaction term between management score and worker quality. Across all specifications, the management score is negatively associated with mental health drug usage. In column (1), a one-unit increase in the management score is associated with a 15% reduction in the usage of all mental health drugs. Similar results are observed for antidepressants in column (2). However, no statistically significant relationship is found for anxiety medications in column (3).

Columns (4)–(6) introduce worker quality and its interaction with management score. Worker quality is negatively associated with the log dosage of all mental health drugs and antidepressants but positively associated with anxiety medication usage, indicating that higher-quality workers are more likely to use anxiety-related drugs. This could reflect stress associated with higher job responsibilities.

The interaction term between management score and worker quality is consistently negative and statistically significant across all specifications. For all drugs (column 4), the coefficient suggests that the reduction in mental health drug usage associated with better

management practices is larger for higher-quality workers. A similar pattern is observed for antidepressants and anxiety medications. These results indicate that higher-quality workers benefit disproportionately from improvements in management practices, likely because effective management enhances task clarity, coordination, and resource allocation—allowing workers to perform their jobs successfully and realize the intrinsic rewards that motivated their career choice.

Table 3 provides analogous results for private sector employees. Consistent with the public sector, management score is negatively associated with mental health drug usage. In column (1), a one-unit increase in the management score reduces the usage of all mental health drugs by 10% . Similar effects are observed for antidepressants, though the magnitudes are smaller than those in the public sector.

When interaction terms are introduced in columns (4)–(6), worker fixed effects show a consistent negative relationship with all mental health drug usage, suggesting that unobserved worker heterogeneity is an important determinant of mental health outcomes. However, the interaction term between management score and worker fixed effects is smaller in magnitude and insignificant. This indicates that, unlike in the public sector, the moderating effect of worker quality on the relationship between management practices and mental health is weaker in the private sector.

Figure 4 compares the average daily dosage of mental health drugs (normalized relative to the entire working population in Denmark) across public and private sector employees, as well as workers in organizations categorized based on their management scores. Organizations with above-average management scores are labeled "well-managed," while those with below-average scores are labeled "badly-managed".

Public sector employees exhibit the highest relative daily dosage of mental health drugs, with an average significantly above the national working population benchmark. This finding aligns with broader evidence suggesting that public sector workers often face higher levels of workplace stress due to factors such as limited resources, bureaucratic constraints, and emotionally demanding roles, particularly in sectors like health and education. In contrast, private sector employees display a negative deviation from the national average, suggesting lower reliance on mental health drugs, which could reflect differences in workplace conditions, management practices, or access to healthcare resources.

The impact of management quality on employee well-being is substantial. Employees in "well-managed" organizations show considerably lower mental health drug usage compared to those in "badly-managed" organizations. This underscores the importance of effective management practices in fostering a healthier work environment, likely through mechanisms such as reduced workplace stress, clearer communication, and better allocation of

resources. Poorly managed organizations, by contrast, may exacerbate stress and mental health challenges, leading to higher medication use. These patterns reinforce the critical role of workplace policies and management strategies in influencing employee well-being.

Figures 5 and 6 display the relative average daily dosage of mental health drugs, normalized within private and public sectors, across sub-industries.

In the public sector (health, education, and administration), the health sub-industry exhibits the highest relative mental health drug usage, particularly in well-managed workplaces. This may reflect the demanding nature of healthcare roles, where even effective management may not fully mitigate mental health challenges. Education and administration, on the other hand, show lower-than-average mental health drug usage, with relatively small differences between well-managed and poorly managed workplaces. This pattern suggests that while management quality impacts employee well-being in the public sector, the effect varies significantly depending on the sub-industry.

In the private sector (manufacturing, retail, and others), manufacturing stands out with significantly higher relative mental health drug usage, particularly among employees in poorly managed ("below average") workplaces. Retail and other industries also exhibit notable variation between poorly and well-managed workplaces, though their overall mental health drug usage remains below the private sector average. This suggests that management quality plays an important role across all industries.

5.2 Heterogeneous effects by worker ability

Figures 7 and 8 illustrate the relationship between management quality and mental health drug usage for workers in the top quartile of ability (red line) and those in the non-top quartile (blue line), with distinct patterns for the private and public sectors.

In the private sector, both top-quartile and non-top-quartile workers experience reductions in mental health drug usage as management quality improves, reflected in the negative slopes of both lines. Importantly, the two lines are almost parallel, indicating that the impact of management quality on mental health outcomes is similar for workers across ability levels. The gap between the lines represents the baseline difference in mental health drug usage, with high-ability workers consistently using fewer mental health drugs regardless of management quality. This suggests that management improvements in the private sector benefit all workers relatively uniformly, highlighting the general importance of good management practices in fostering well-being across the workforce.

In the public sector, the relationship between management quality and mental health drug usage differs significantly. For non-top-quartile workers (blue line), the reduction in

drug usage is modest as management quality improves, with a relatively flat slope. In contrast, top-quartile workers (red line) exhibit a much steeper decline in drug usage as management quality increases. This indicates that high-ability workers in the public sector are more sensitive to management quality, benefiting disproportionately from well-managed environments.

Taken together, these results reveal important sectoral differences in how management quality interacts with worker ability to influence mental health outcomes. In the private sector, management improvements yield broadly similar benefits across all ability levels. In the public sector, however, high-ability workers are particularly responsive to management quality, highlighting the need for targeted management strategies that address the unique challenges faced by top-performing employees in public organizations. These findings align with the results from Table 4 and 5, emphasizing the interaction between workplace management and worker ability in shaping mental health outcomes.

5.3 Types of management and mental health

Tables 4 and 6 present the relationship between different types of management practices — performance monitoring, target-setting, and incentives — and mental health drug usage in the public and private sectors, respectively. Each panel corresponds to one type of management practice and examines its direct effect, its interaction with worker quality, and the resulting implications for mental health outcomes (log of drug usage of all mental health-related drugs, antidepressants, and anxiety).

In the public sector, performance monitoring (Panel A) shows limited effects on mental health outcomes. The coefficients for performance practices are small and statistically insignificant across all measures. However, worker quality consistently shows a strong, negative association with mental health drug usage for all drugs and antidepressants, while positively associated with anxiety drug usage, which is consistent with Table 2. The interaction term between performance and worker quality is negative and significant for all drugs, suggesting that high-quality workers benefit more from performance monitoring practices. Target-setting (Panel B) demonstrates negligible direct effects. Incentives (Panel C) yield the most pronounced effects, with negative and significant coefficients across all measures. For example, a one-unit increase in incentive management is associated with a 15% reduction in overall drug usage, and the interaction terms further amplify this reduction for high-quality workers.

In the private sector, the patterns are broadly consistent but show some notable differences. Performance monitoring (Panel A) has no significant effects on mental health

outcomes, with small coefficients across all models. Target-setting (Panel B) also shows little direct effect. Incentive practices (Panel C) again display the strongest associations, with negative and significant coefficients across all measures. For instance, incentives reduce overall drug usage and antidepressants, with interaction terms showing a significant, though smaller, additional benefit for high-quality workers. While worker quality is consistently positively related to less mental health drugs, anxiety drug usage is higher for high quality workers.

These patterns reveal that incentive-related practices show the strongest associations with mental health outcomes across both sectors. Management practices explicitly linking performance to rewards or consequences are more strongly associated with reduced mental health drug usage than practices focused on information provision (monitoring) or goal-setting (targets). This is consistent with incentive practices being more salient for workers—particularly high-ability workers who are most responsive to performance-based rewards—and potentially creating clearer pathways for workers to connect their effort to meaningful outcomes.

5.4 Mechanism: Why Do Incentives and Performance Monitoring Matter Most?

The results in Tables 4 and 6 show that incentive-related management practices have the strongest association with mental health outcomes, with performance monitoring also showing significant effects for high-ability workers in the public sector. We investigate whether these practices correlate with systematic worker selection patterns that could help explain their relationship with mental health. Table 7 presents correlations between management practices and worker quality. Column (4) examines the quality gap between workers who stay versus those who leave the organization—positive values indicate that higher-quality workers are more likely to remain. Overall management quality shows a strong positive correlation (0.389), indicating that better-managed organizations systematically retain higher-quality workers. Decomposing by management practice reveals that incentives and performance monitoring drive this pattern. Incentive management shows the strongest correlation with favorable worker selection (0.433, significant at the 1% level). Performance monitoring also shows a positive correlation (0.168), though not statistically significant. Target-setting, in contrast, shows essentially no relationship (-0.037).

These sorting patterns suggest two non-mutually exclusive interpretations of the mental health associations observed in Tables 4 and 6. First, incentive and monitoring practices may directly improve working conditions for high-ability workers by providing clear performance feedback and linking contributions to recognition and advancement. Second, these practices

may select for workers who thrive in performance-oriented environments—attracting and retaining employees for whom such management reduces rather than increases stress. Our cross-sectional design cannot distinguish between these interpretations. The observed associations likely reflect both channels: management practices shaping workplace conditions and sorting workers into organizations where they are well-matched.

This is particularly relevant in the public sector, where high-ability workers accept wage penalties to pursue meaningful work. For these workers, management practices linking performance to recognition (monitoring) and advancement (incentives) may both enable mission accomplishment and select for employees who value such recognition. Workers poorly matched to performance-oriented environments sort out, while those who remain benefit from clear expectations and acknowledged contributions. Target-setting, by contrast, shows neither sorting effects nor mental health associations, suggesting it influences neither match quality nor working conditions in ways that benefit high-ability workers.

6 Conclusion

Management practices shape not only organizational productivity but also employee mental health. Understanding this relationship is increasingly urgent given that mental health conditions affect one in five working-age adults and cost over 4% of GDP across OECD countries. This paper provides one of the first large-scale examinations of how management practices influence employee mental health outcomes, in both private and public sectors.

Key to our analysis is our Danish empirical setting, which links comprehensive management surveys with administrative prescription drug records for over 600,000 workers. With this rich data, we observe complete employment histories, worker ability measures, and objectively measured mental health outcomes through pharmaceutical dispensations.

We show that better management practices reduce mental health medication use by 14% in the public sector and 10% in the private sector. However, these effects vary systematically across worker ability and sector. In the private sector, management improvements benefit workers uniformly across ability levels. In the public sector, high-ability workers show dramatically greater sensitivity to management quality, while low-ability workers exhibit modest effects. This asymmetry reflects the distinctive position of high-ability public sector employees, who accept substantial wage penalties for mission-driven work.

When we distinguish between management practice dimensions, we find that incentive systems and performance monitoring drive the strongest effects, reducing drug usage by 15%, while target-setting shows negligible impact. Organizations with stronger incentive and monitoring practices systematically attract and retain higher-quality workers, suggest-

ing these practices create environments where high-ability employees thrive—either through improved working conditions or better worker-organization matching.

While our analysis documents robust correlation, it does not permit strong causal claims about whether management practices directly improve mental health or operate primarily through worker selection. The evidence is consistent with a model in which incentive and monitoring practices both directly reduce workplace stress for high-ability workers and attract employees well-matched to performance-oriented settings.

From a policy perspective, our findings have clear implications for organizational practice. For public sector organizations competing for talent against higher-paying private sector alternatives, investing in well-designed incentive systems and performance monitoring is a crucial strategy for retaining high-ability workers. Poor management imposes disproportionate mental health costs on precisely those employees who accept wage penalties to pursue mission-driven work. More broadly, our results demonstrate that management practices shape employee welfare as well as organizational productivity.

Our analysis opens several important avenues for future work. First, there is scope to examine how management practices interact with other workplace policies. Do structured practices complement or substitute for formal mental health support programs? Second, we have focused on mental health medication use, which captures more severe conditions requiring pharmaceutical intervention. Understanding how management practices affect broader well-being measures such as job satisfaction and mild-to-moderate stress could provide a more complete picture. Finally, our findings suggest that high-ability public sector workers are particularly sensitive to management quality, yet the mechanisms underlying this sensitivity remain unobserved. Understanding whether effective management increases fulfillment or whether poor management generates disproportionate frustration could inform more targeted interventions in public sector organizations competing for talent.

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Tables and Figures

Figure 1: Intrinsic Work Motivation by Worker Ability and Sector

This figure plots the relationship between worker ability and responses to the survey questions 1) "To what extent is work interesting and inspiring to you?" and 2) "To what extent is work important to you in addition to income?" on a scale from 0 (not at all important) to 1 (extremely important). The red line represents public sector workers and the blue line represents private sector workers. Worker ability is measured using AKM worker fixed effects estimated from wage regressions. Public sector workers consistently report higher intrinsic work importance than private sector workers across the ability distribution, with the gap most pronounced among lower-ability workers.

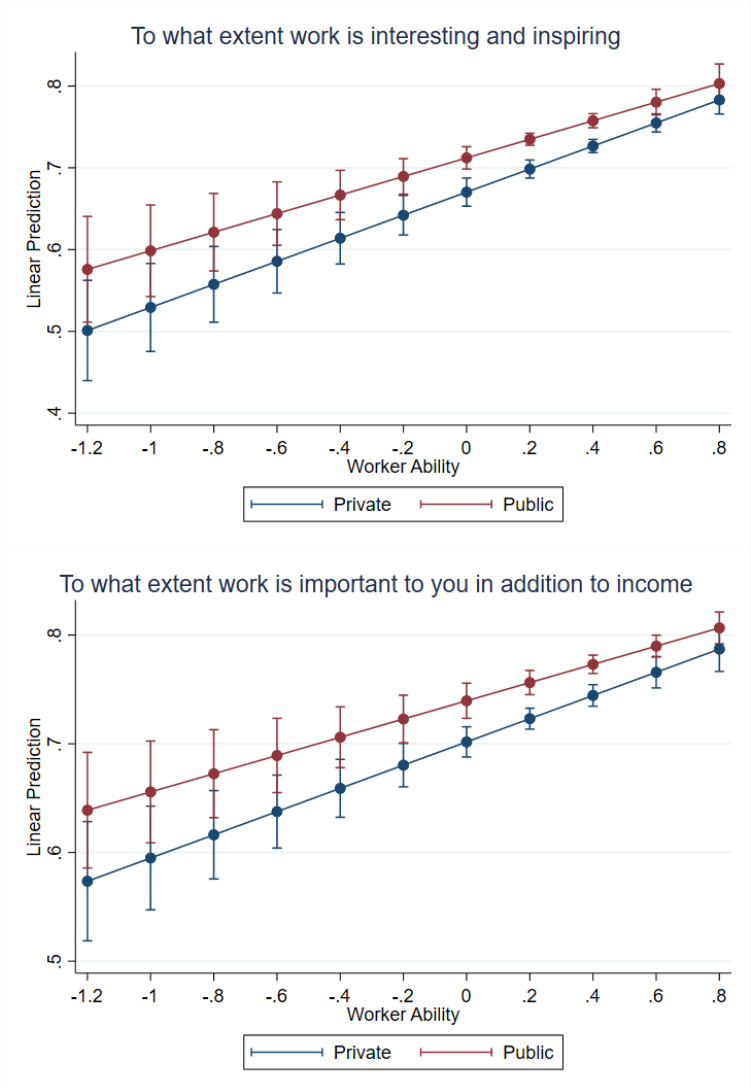


Figure 2: Wage by Worker Ability and Sector

This figure plots the relationship between worker ability and log wages across private and public sectors. The blue line represents private sector workers and the red line represents public sector workers. Worker ability is measured using AKM worker fixed effects estimated from wage regressions.

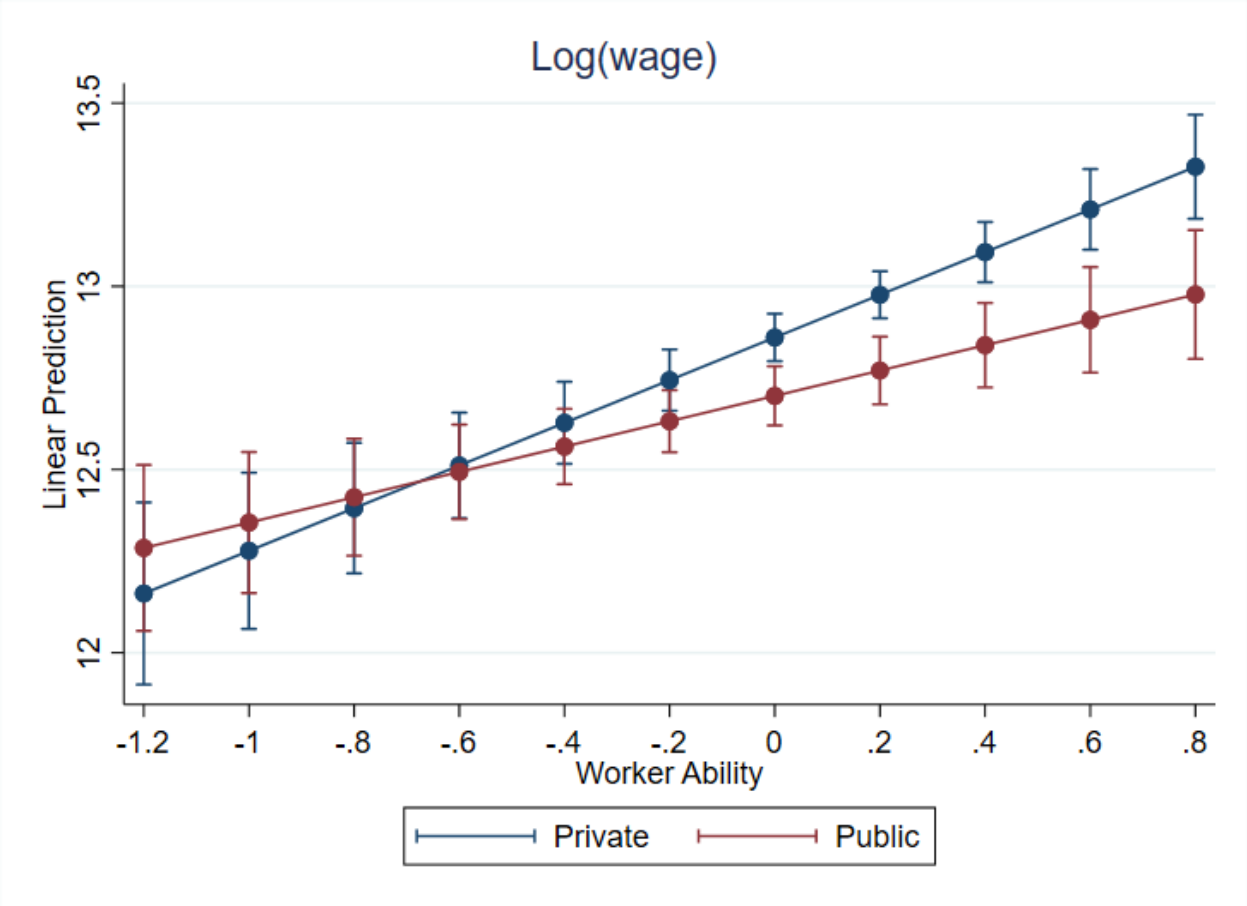


Figure 3: Average Management Score across Industries

This figure illustrates the average management scores across industries, categorized into private sector and public sector sub-industries. The number of workplaces surveyed within each category is denoted by N.

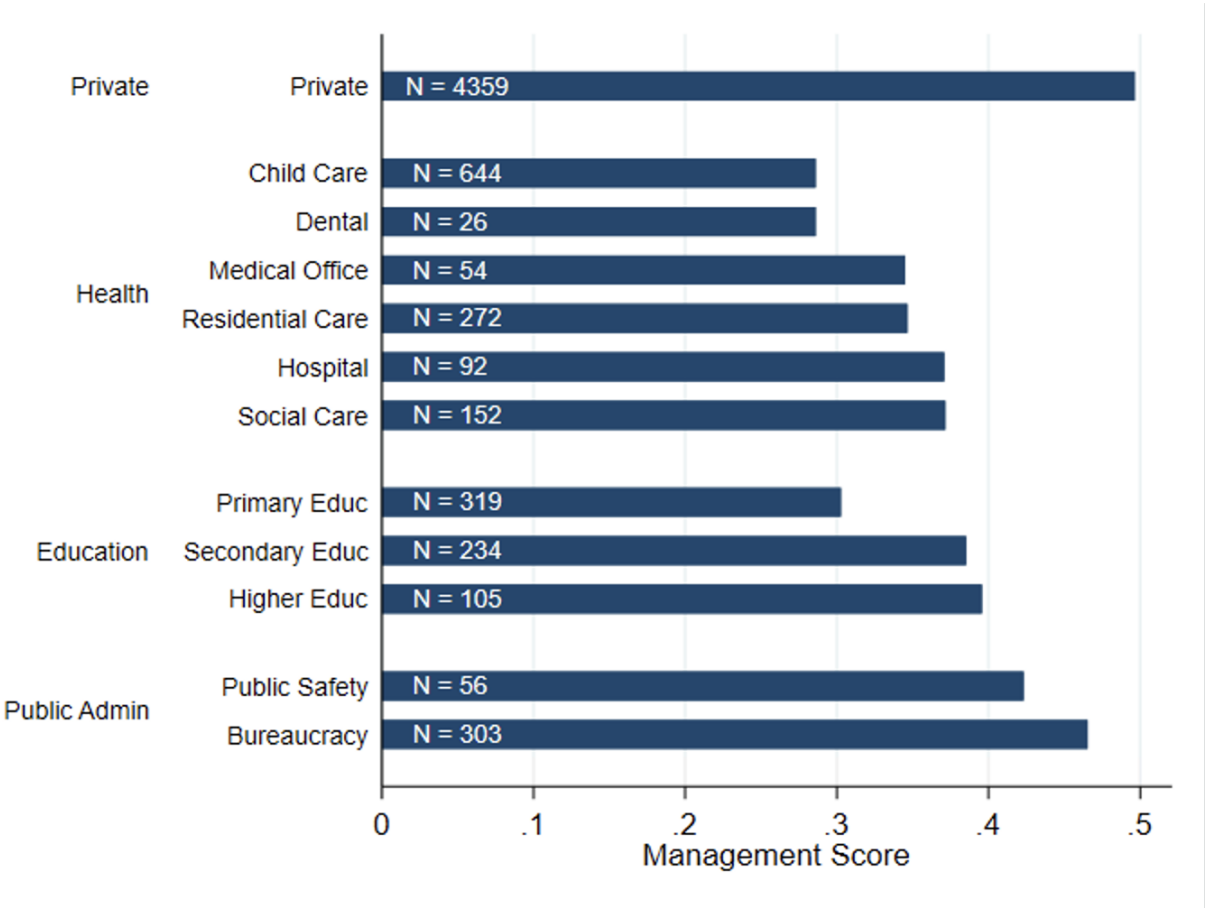


Figure 4: Average Mental Health Drug Usage

This figure compares the average mental health drug usage (normalized relative to the national working population) across public and private sector employees, as well as workers in well-managed and poorly managed workplaces.

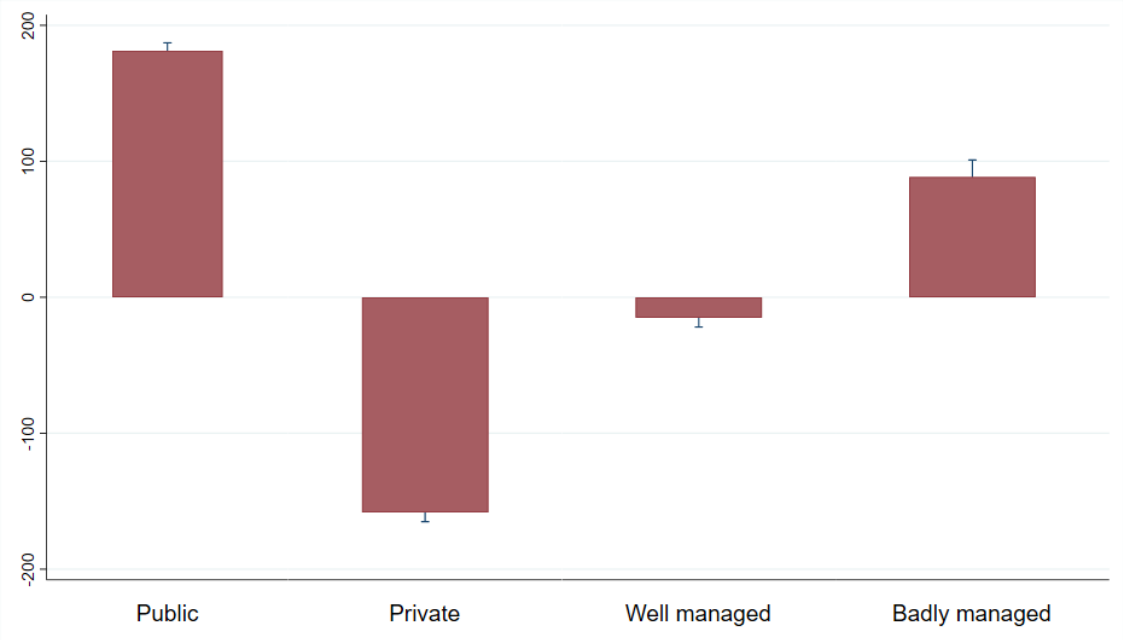


Figure 5: Average Mental Health Drug Usage in Public Sector

This figure shows the average mental health drug usage (normalized relative to the public sector working population) across public sector sub-industries: Health, Education, and Administration. Each sub-industry is further divided into "All," "Below median management score," and "Above median management score".

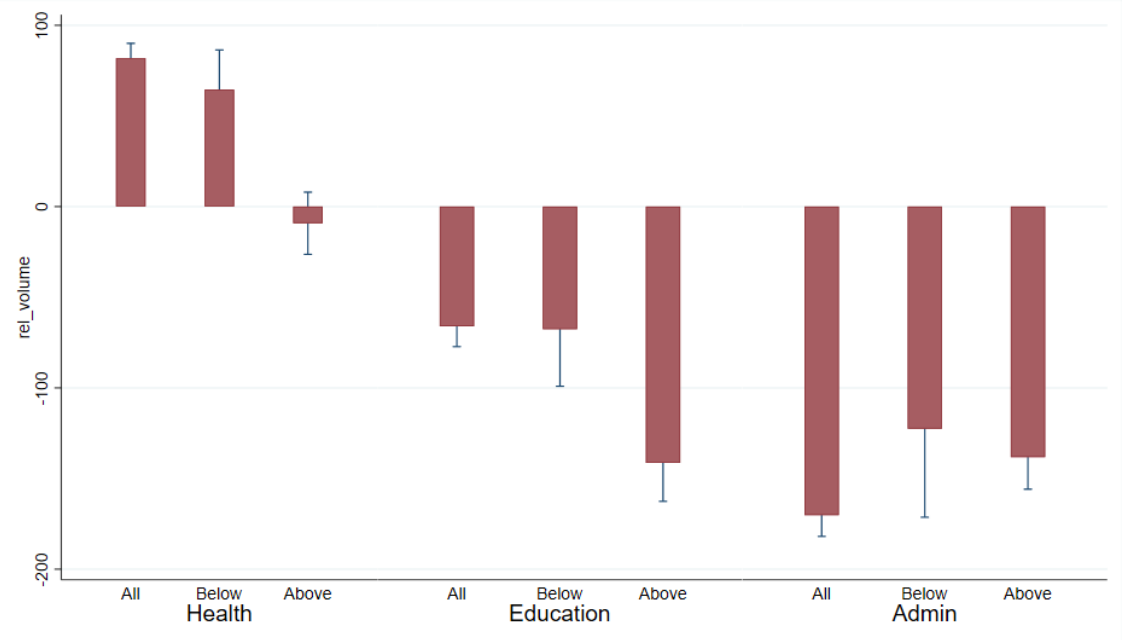


Figure 6: Average Mental Health Drug Usage in Private Sector

This figure shows the average mental health drug usage (normalized relative to the private sector working population) across private sector sub-industries: Manufacturing, Retail, and Others. Each sub-industry is further divided into "All," "Below median management score," and "Above median management score".

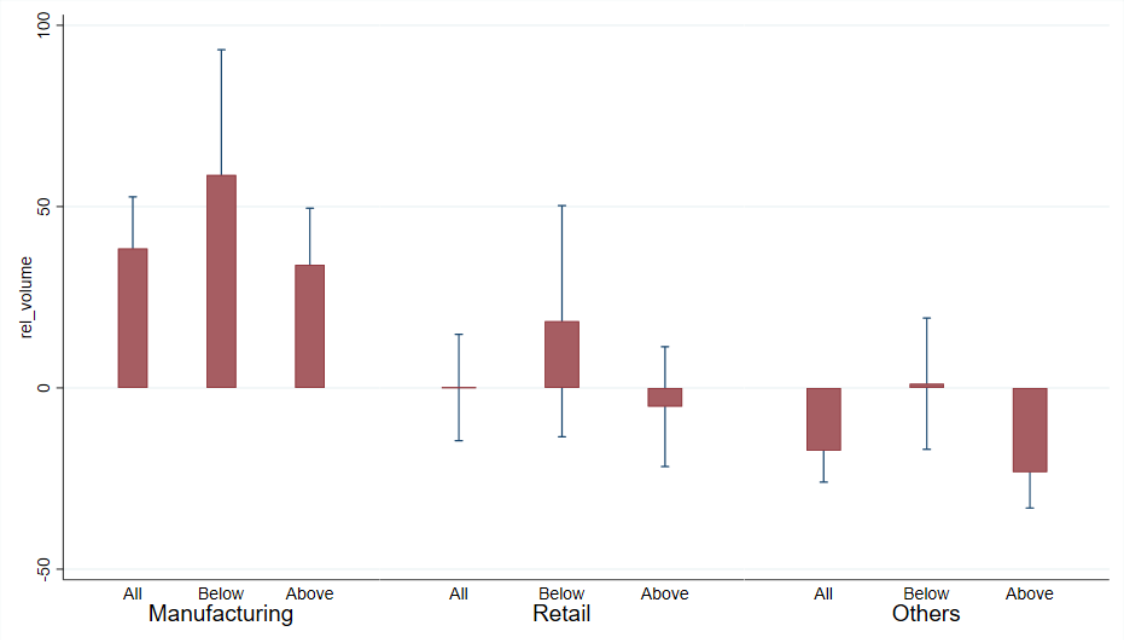


Figure 7: Margins Plot on Mental health in Public Sector

This figure presents predictive margins of mental health drug usage (linear prediction) for public sector workers across management quality scores, distinguishing between top quartile and non-top quartile workers based on worker fixed effects (FE). The red line represents top-quartile workers and the blue line represents non-top-quartile workers.

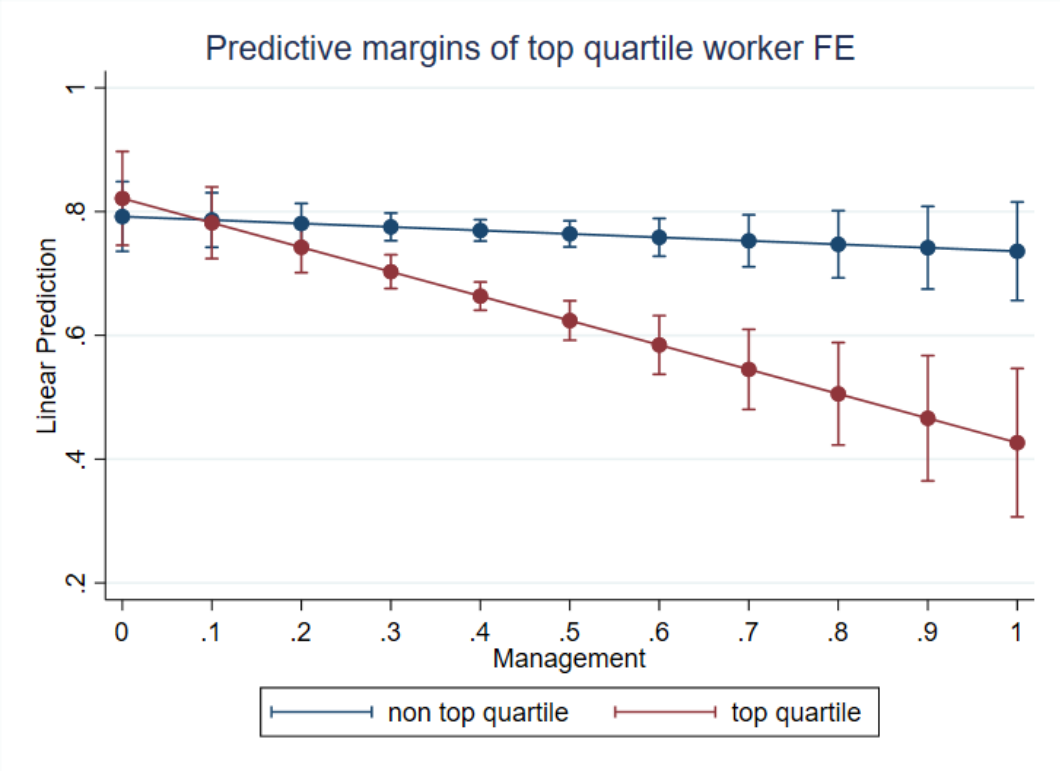


Figure 8: Margins Plot on Mental health in Private Sector

This figure presents predictive margins of mental health drug usage (linear prediction) for private sector workers across management quality scores, distinguishing between top quartile and non-top quartile workers based on worker fixed effects (FE). The red line represents top-quartile workers and the blue line represents non-top-quartile workers.

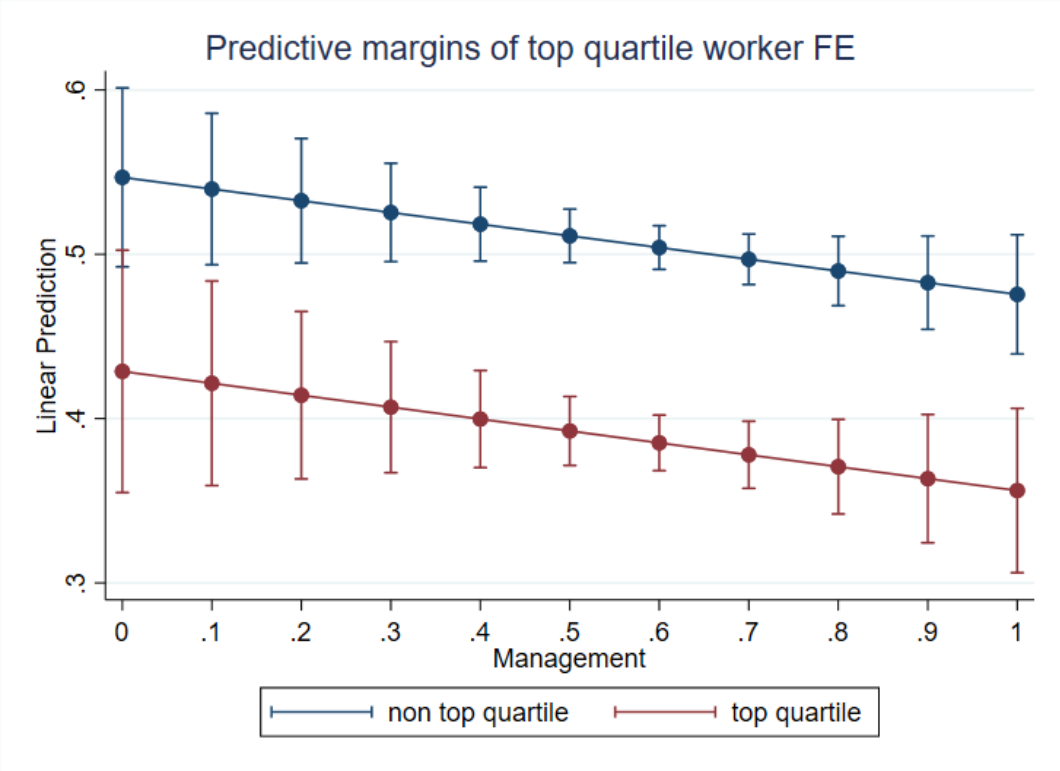


Table 1: Characteristics of All Population and Sample Population

This table summarizes the characteristics of the full population (Panel A) and the study sample (Panel B) across the private and public sectors, as well as sub-sectors within the public sector: Health, Education, Administration, and Others. Key variables include demographic traits (e.g., gender, managerial roles), employment characteristics (e.g., tenure, wages), and mental health metrics (e.g., drug usage incidence and volume for antidepressants and anxiety medications).

Panel A: Population	**Private**	**Public**	**Health**	**Education**	**Admin**	**Others**
# Obs	2386482	989977	492364	226591	151213	264575
Female	0.311	0.585	0.809	0.607	0.525	0.219
Manager	0.166	0.066	0.113	0.108	0.047	0.046
Tenure	5.959	6.533	6.635	7.243	6.298	5.996
Wage (thousand kroner)	298.731	361.493	340.867	381.702	446.984	284.922
AKM FE rank	49.619	52.383	50.478	55.555	54.596	54.056
School grade rank	49.350	50.305	48.221	52.974	52.822	51.275
Mental health drug (incidence)	0.064	0.097	0.104	0.083	0.069	0.108
Mental health drug (volume)	7088.947	7825.759	7785.110	7351.923	7497.412	8011.960
Antidepressant (incidence)	0.042	0.067	0.072	0.058	0.047	0.075
Antidepressant (volume)	406.335	684.158	731.788	556.879	470.602	780.125
Anxiety (incidence)	0.025	0.037	0.040	0.032	0.028	0.043
Anxiety (volume)	1313.693	1400.031	1494.438	1266.077	1368.780	1441.119
Panel B: Sample						
# Obs	215265	314110	162237	75347	84897	3689
Female	0.331	0.699	0.807	0.571	0.593	0.374
Manager	0.023	0.043	0.035	0.061	0.039	0.015
Tenure	6.706	7.015	7.208	7.081	6.407	7.957
Wage (thousand kroner)	429.322	425.239	408.608	416.980	457.290	448.463
AKM FE rank	50.152	50.179	48.033	52.070	52.152	58.380
School grade rank	53.864	54.003	51.579	56.891	56.078	.
Mental health drug (incidence)	0.055	0.086	0.097	0.077	0.073	0.068
Mental health drug (volume)	6703.497	7365.188	7180.605	7199.638	7890.602	6480.918
Antidepressant (incidence)	0.036	0.059	0.065	0.053	0.050	0.046
Antidepressant (volume)	9277.483	9741.010	9441.362	9489.301	10627.048	8834.692
Anxiety (incidence)	0.021	0.035	0.039	0.030	0.029	0.031
Anxiety (volume)	1086.864	1437.484	1536.489	1385.583	1265.192	1043.195

Table 2: Mental Health in Public Sector

This table presents OLS regression of mental health outcomes on management and worker quality in the public sector. The outcome variables include the log of all mental health drugs, the log of antidepressants, and the log of anxiety-related drugs (in daily dosage units). Regression is on the individual level. Controls include log(employee num) of the workplace, worker gender, indicator for college degree, and log(age). It includes industry fixed effects, and the standard error is clustered at the workplace level.

	(1)	(2)	(3)	(4)	(5)	(6)
	log(all)	log(antidep)	log(anxiety)	log(all)	log(antidep)	log(anxiety)
Management score	-0.138**	-0.103**	-0.0141	-0.140**	-0.107**	-0.0104
	(-2.18)	(-2.10)	(-0.47)	(-2.22)	(-2.21)	(-0.35)
Worker quality				-0.100***	-0.181***	0.142***
				(-3.31)	(-7.84)	(9.02)
Management score × Worker quality				-0.137***	-0.0651*	-0.0500*
				(-2.92)	(-1.77)	(-1.92)
Observations	290438	290438	290438	290438	290438	290438

Table 3: Mental Health in Private Sector

This table presents OLS regression of mental health outcomes on management and worker quality in the private sector. The outcome variables include the log of all mental health drugs, the log of antidepressants, and the log of anxiety-related drugs (in daily dosage units). Regression is on the individual level. Controls include log(employee num) of the workplace, worker gender, indicator for college degree, and log(age). It includes industry fixed effects, and the standard error is clustered at the workplace level.

	(1)	(2)	(3)	(4)	(5)	(6)
	log(all)	log(antidep)	log(anxiety)	log(all)	log(antidep)	log(anxiety)
Management score	-0.0960**	-0.0577*	-0.0213	-0.0767*	-0.0387	-0.0263
	(-2.28)	(-1.74)	(-1.18)	(-1.78)	(-1.16)	(-1.46)
Worker quality				-0.168***	-0.168***	0.0575***
				(-5.86)	(-8.24)	(3.82)
Management score × Worker quality				-0.0214	-0.0169	-0.0257
				(-0.59)	(-0.64)	(-1.39)
Observations	199095	199095	199095	199095	199095	199095

Table 4: Types of Management on Mental Health in Public Sector

This table presents OLS regression of mental health outcomes on the subcategories of management and worker quality in the public sector. The subcategories include performance tracking, target setting, and incentives. The outcome variables include the log of all mental health drugs, the log of antidepressants, and the log of anxiety-related drugs (in daily dosage units). Regression is on the individual level. Controls include log(employee num) of the workplace, worker gender, indicator for college degree, and log(age). It includes industry fixed effects, and the standard error is clustered at the workplace level.

	(1) log(all)	(2) log(antidep)	(3) log(anxiety)	(4) log(all)	(5) log(antidep)	(6) log(anxiety)
Panel A						
Performance	-0.0508	-0.0228	-0.0208	-0.0526	-0.0293	-0.0142
	(-1.12)	(-0.66)	(-1.00)	(-1.17)	(-0.85)	(-0.69)
Worker quality				-0.118***	-0.184***	0.126***
				(-4.65)	(-9.57)	(10.42)
Performance × Worker quality				-0.115***	-0.0721***	-0.0134
				(-3.40)	(-2.66)	(-0.69)
Panel B						
Target	0.0205	0.0131	0.00164	0.0200	0.0126	0.00195
	(0.49)	(0.39)	(0.08)	(0.48)	(0.38)	(0.10)
Worker quality				-0.157***	-0.217***	0.127***
				(-5.49)	(-10.08)	(7.62)
Target × Worker quality				0.000675	0.0140	-0.0102
				(0.02)	(0.50)	(-0.52)
Panel C						
Incentives	-0.125**	-0.108**	0.00490	-0.123**	-0.105**	0.00320
	(-2.21)	(-2.44)	(0.19)	(-2.18)	(-2.40)	(0.12)
Worker quality				-0.123***	-0.199***	0.144***
				(-4.23)	(-8.98)	(8.87)
Incentives × Worker quality				-0.0741*	-0.0213	-0.0507**
				(-1.71)	(-0.63)	(-2.11)
Observations	289898	289898	289898	289898	289898	289898

Table 5: Types of Management on Mental Health in Private Sector

This table presents OLS regression of mental health outcomes on the subcategories of management and worker quality in the private sector. The subcategories include performance tracking, target setting, and incentives. The outcome variables include the log of all mental health drugs, the log of antidepressants, and the log of anxiety-related drugs (in daily dosage units). Regression is on the individual level. Controls include log(employee num) of the workplace, worker gender, indicator for college degree, and log(age). It includes industry fixed effects, and the standard error is clustered at the workplace level.

	(1) log(all)	(2) log(antidep)	(3) log(anxiety)	(4) log(all)	(5) log(antidep)	(6) log(anxiety)
Panel A						
Performance	0.00160	0.0169	0.00765	0.0104	0.0268	0.00486
	(0.04)	(0.53)	(0.51)	(0.25)	(0.86)	(0.32)
Worker quality				-0.169***	-0.181***	0.0475***
				(-6.89)	(-9.90)	(4.21)
Performance × Worker quality				-0.0230	0.00332	-0.0116
				(-0.70)	(0.13)	(-0.76)
Panel B						
Target	-0.0268	-0.0225	0.00339	-0.0245	-0.0196	0.00200
	(-0.74)	(-0.84)	(0.21)	(-0.67)	(-0.74)	(0.12)
Worker quality				-0.146***	-0.155***	0.0482***
				(-4.78)	(-7.27)	(2.69)
Target × Worker quality				-0.0374	-0.0237	-0.00940
				(-1.15)	(-1.01)	(-0.51)
Panel C						
Incentives	-0.0945***	-0.0619**	-0.0228	-0.0787**	-0.0464	-0.0272*
	(-2.62)	(-2.18)	(-1.45)	(-2.14)	(-1.63)	(-1.73)
Worker quality				-0.172***	-0.168***	0.0557***
				(-6.45)	(-8.97)	(3.90)
Incentives × Worker quality				-0.0145	-0.0170	-0.0221
				(-0.46)	(-0.76)	(-1.34)
Observations	199095	199095	199095	199095	199095	199095

Table 6: Mental Health Firm FE

This table presents firm-level OLS regressions in which the dependent variable is the firm fixed effect in antidepressant use estimated from an AKM (Abowd-Kramarz-Margolis) worker–firm model. The AKM firm fixed effect captures persistent firm-level differences in antidepressant utilization after accounting for worker composition and worker fixed effects, and thus reflects workplace-level variation in mental health outcomes. The analysis is conducted separately for firms above and below the median of the antidepressant firm fixed-effect distribution. The main independent variable is the management score. Controls include log employment at the workplace, log average worker age, the share of female employees, the share of workers with a college degree. The sample covers the years 2016–2022. Standard errors are clustered at the production-unit level.

	(1)	(2)
	Above Median	Below Median
management	-3.789**	1.823
	(-1.99)	(0.77)
Constant	56.78***	29.49***
	(7.06)	(3.29)
Observations	10633	7993

Table 7: Correlation between Managament and Quality of Workers

This table presents OLS regressions examining the correlation between management practices and worker quality across different worker groups. Column (1) shows the relationship with average worker quality (AKM fixed effects) across all workers at the workplace. Column (2) examines worker quality among stayers (workers who remain at the workplace). Column (3) examines worker quality among new hires. Column (4) presents the difference in worker quality between stayers and leavers, where positive values indicate that higher-quality workers are more likely to remain at the workplace. Panel A reports results using the overall management score. Panel B decomposes management into three components: performance monitoring, target-setting, and incentive practices. Standard errors are clustered at the workplace level, with t-statistics reported in parentheses.

	(1) All	(2) Stayers	(3) New Hires	(4) Δ Stayers - Leavers
Panel A				
Management	0.207***	0.153***	0.207***	0.389***
	(3.99)	(3.01)	(3.02)	(2.76)
Panel B				
Performance	0.168***	0.133***	0.134**	0.0728
	(4.17)	(3.35)	(2.51)	(0.75)
Target	-0.0372	-0.0313	-0.0551	0.127
	(-1.23)	(-1.09)	(-1.34)	(-1.34)
Incentives	0.102**	0.0639	0.139**	0.433***
	(2.23)	(1.43)	(2.42)	(3.31)
Observations	2116	2116	2116	2116

A Appendix

Table A1: Productivity and Management

This table presents the OLS correlation between management score and multiple measures of performance in the private sector. It includes industry fixed effects at the one digit level. Standard errors are clustered. TFP is calculated following Wooldridge (2009).

	(1) log(value-added)	(2) log(value-added)	(3) log(net sales)	(4) log(profit)	(5) log(profit)	(6) log(profit)	(7) ROCE	(8) TFP
Management	0.443***	0.443***	0.496*	0.425***	0.451***	0.629***	0.290**	0.254***
	(4.38)	(4.38)	(2.00)	(3.91)	(4.35)	(3.48)	(2.18)	(4.48)
log(employee)	0.875***	0.875***	0.920***	0.920***	1.009***	0.884***	-0.0365	0.322***
	(46.52)	(46.52)	(17.52)	(47.03)	(44.88)	(11.48)	(-1.67)	(14.97)
Constant	13.52***	6.611***	7.837***	6.465***	13.42***	4.426***	0.159**	2.446***
	(234.81)	(114.83)	(41.76)	(89.03)	(188.50)	(16.42)	(2.39)	(34.10)
Observations	4017	4017	593	4292	4025	3398	4398	3836

Table A2: Education Sector Productivity and Management Score

This table presents OLS regressions of teacher-level outcomes on management quality: (1) teacher value added, (2) national test scores in math, and (3) national test scores in Danish. Teacher value added is constructed as the best linear predictor of teacher-specific value added in each observed year, using student test scores from other years in which the teacher taught 9th grade. Value added is allowed to vary over time; drift is accommodated by permitting the coefficients on past score data to vary non-parametrically with the distance between the observed score year and the forecast year. The sample includes only 9th-grade teachers due to data availability and is restricted to public-sector schools. All regressions include teacher and school-level controls. Robust standard errors are reported in parentheses. National test scores are standardized, computer-adaptive assessments of 6th and 8th-grade students administered by the Danish Ministry of Education and completed online in public schools. All regressions include school-level controls and municipality fixed effects.

	Teacher Value-added	National Test - Math	National Test - Danish
	(1)	(2)	(3)
Management Score	0.4141***	1.7611	3.2330**
	(0.0752)	(2.1267)	(1.6142)
Observations	3,660	1629	1629
Year	2018-2019	2018-2020	2018-2020