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Review Article

Clinician Morbidity and Mortality Across Career Stages, Gender, and Medical and Surgical Specialties

Olubusola Amu[1]*, Mariam Abdallah[2], Morounfolu Leye Thompson[3], Huda Saleh[1], Salwa Abu Yaqoub[1] and Zeina Bu Shurbak[1]

[1]Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar
[2]College of Medicine, Qatar University, Doha, Qatar
[3]Al Wakra Hospital, Al Wakra, Qatar

***Corresponding Author:** Olubusola Amu, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar.

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Abstract

Medical knowledge and access to treatment do not fully protect clinicians from serious illness. Physicians generally have lower all-cause mortality than the public, yet particular causes of death and forms of morbidity are concentrated in specific professional groups. This critical narrative article examines mortality and physical and mental morbidity across career grade, gender, and clinical specialty, including individual surgical disciplines. It draws on population-linked mortality cohorts, trainee registries, occupational surveillance, and systematic reviews, while recognising that these studies measure different aspects of risk. Recent US death certificate data report lower physician mortality than that of income-comparable nonhealthcare workers, but identify substantial sex and racial differences. A separate 2023 analysis found higher adjusted mortality among surgeons than nonsurgeon physicians. Resident registries document low overall mortality relative to age-matched populations, while suicide remains a prominent cause of trainee death. International evidence indicates elevated suicide risk among female physicians relative to women in the general population, although estimates vary by era and setting. Beyond mortality, depression, burnout, pregnancy complications, musculoskeletal injury, infection, and occupational violence vary with the work clinicians do and the conditions in which they practise. Evidence on direct comparisons between grades is sparse, and specialty rankings derived from small death counts are unstable. Prevention therefore requires linked, longitudinal surveillance and workplace interventions tailored to exposure, with confidential clinical care available at every career stage. Occupational research and healthcare policy should address clinicians' health directly.

Keywords: *Clinicians; Occupational Mortality; Physician Health; Medical Trainees; Gender; Specialty; Suicide; Burnout; Occupational Morbidity*

Introduction

Knowing how to diagnose and treat disease does not necessarily make it easier to recognise illness in oneself, seek help, or take time away from work. Medical work brings advantages associated with education and employment, together with repeated contact with infection, disrupted sleep, difficult decisions, physical strain, violence, and access to potentially lethal medicines. These influences do not fall equally on a junior doctor working nights, a consultant surgeon, a community nurse, or a clinician nearing retirement. These differences depend on clinical duties, career stage, gender, and wider social circumstances.

A favourable all-cause mortality rate can conceal preventable deaths or substantial nonfatal illness. In a US study of adults aged 25 to 74 years, annual age- and sex-adjusted physician mortality was 269.3 per 100,000, compared with 499.2 in high-income nonhealthcare occupations. That advantage was not distributed evenly by sex or race [1]. A study using 2023 certificates found adjusted rates of 355.3 per 100,000 among surgeons and 228.4 among nonsurgeon physicians [2]. These differences require explanation; the figures alone cannot establish causation.

This article examines the evidence on illness and death among clinicians, with particular attention to career grade, gender, and specialty. "Clinician" includes physicians and, where a study permits, nurses and other patient-facing professionals. The greatest detail concerns physicians because specialty and grade are rarely recorded reliably for the wider workforce. Grade refers to training and career position, not to a uniform international hierarchy: intern, resident, registrar, attending, consultant, and senior clinician have different meanings across systems. Gender is discussed as reported in the source studies, many of which measured binary sex rather than gender identity. These differences in definition must be considered before applying findings from one country to another.

How occupational risk should be measured

Mortality comparisons require a defined workforce, reliable follow-up, and comparators of similar age and social circumstances. Standardised mortality ratios compare observed with expected deaths, but comparison with the general population may exaggerate an affluent profession's apparent advantage. Proportionate mortality ratios describe a cause's share of deaths rather than its incidence. Certificates may record usual occupation instead of work at death, and age restrictions exclude much late-life disease. Migration, missing occupational fields, and imperfect suicide classification introduce further uncertainty.

Morbidity measurement poses additional problems. Burnout scales and positive depression screens do not establish psychiatric diagnoses. Surveys may miss clinicians on leave or those who have left practice, while attracting respondents with strong views. Specialty differences can reflect age, sex, hours, pregnancy, income, patient mix, and institutional conditions. Findings gain credibility when repeated across settings with consistent definitions and measured exposures.

In approximately 20,000 British NHS hospital consultants followed over three decades, 2,798 deaths at ages 25 to 74 produced an all-cause standardised mortality ratio of 48, with national rates defined as 100 [3]. Lower smoking-related and cardiovascular mortality plausibly contributed. Yet accidental poisoning among male consultants and suicide among female consultants remained concerns. Isolated specialty cancer excesses could reflect chance across multiple comparisons. Low overall mortality therefore neither excludes occupational harm nor proves that an isolated excess is work-related.

Mortality across career grade

Medical students and early training

Students are not usually included in occupational death registries, and reliable international student mortality denominators are scarce. Their mental health is nevertheless relevant to understanding the years that follow. A systematic review of 167 cross-sectional studies and 16 longitudinal studies estimated depression or depressive symptoms in 27.2% of medical students and suicidal ideation in 11.1%; only a minority of those screening positive reported seeking psychiatric treatment [4]. Because the studies used different questionnaires, samples, and recall periods, these estimates should not be read as rates of diagnosed illness. They do show that substantial distress is present before clinical employment begins.

Entry into residency brings an abrupt change in hours, responsibility, supervision, and control. A meta-analysis of 54 studies involving 17,560 resident physicians estimated depression or depressive symptoms in 28.8%, with prevalence differing substantially by instrument. In the longitudinal studies, symptoms rose after the start of training [5]. These figures cannot trace the same people from medical school

into residency, since the samples and measures differ. Training programmes should anticipate difficulties at entry and make confidential support readily available.

For doctors in training, the clearest mortality evidence comes from US accreditation records linked to death records. Among 381,614 residents contributing approximately 1.62 million person-years in 2000-2014, neoplastic disease was the leading broad cause of death and suicide the second, with 66 suicide deaths [6]. A later analysis identified 161 deaths in 2015-2021, including 47 suicides, 28 deaths from neoplastic disease, 22 from accidents, and 21 from accidental poisoning [7]. Across the combined 22 years, the investigators described 710,286 residents and fellows and 2.58 million resident-years. Rates of trainee death from most causes, including suicide, remained below those of age and sex-matched population peers. Suicide may therefore be a leading cause of death among young doctors even when their suicide rate is lower than that of the general population. The later study described clustering of suicide at the beginning of the first training year and toward the end of the second, a pattern that needs further study before its causes can be understood [7].

Senior clinicians and the years after training

The consultant cohort provides historical evidence of survival among senior hospital doctors, but its entry requirements and observation period differ fundamentally from trainee cohorts [3]. Clinicians who reach senior posts have survived earlier risks and may have had better health, resources, or career stability than those who left. Comparing these two cohorts cannot tell us whether promotion itself protects health. Much less is known about the years between completion of training and late career, or about health after early retirement, disability, and exit from clinical work.

Senior roles may bring autonomy and schedule control alongside managerial responsibility, litigation, isolation, and cumulative disease. Age confounds crude comparisons between grades. Reliable assessment requires following clinicians through training, practice, and retirement, recording specialty changes and actual hours. Existing studies rarely provide this continuity. Prevention should address measured hazards without assuming that promotion necessarily improves health.

Gender and inequalities in clinician health

Mortality among female physicians

In most working populations women have markedly lower mortality than men. The 2020-2022 US death certificate analysis found a female-to-male mortality ratio of 0.55 in all nonhealthcare occupations and 0.60 in high-income nonhealthcare occupations, but 0.97 among physicians, with a confidence interval spanning unity [1]. Female physicians had higher mortality than male physicians from neoplasms and chronic lower respiratory diseases in that dataset. Black-to-White mortality differences were particularly large among physicians, with an adjusted ratio of 2.13; Black female physicians had the highest rates among the physician subgroups described [1]. These findings warrant investigation. The study covered working-age deaths during a pandemic, used usual occupation on certificates, and did not measure working conditions, screening histories, or lifetime income. It identifies an inequality that needs explanation, while leaving its causes and persistence uncertain.

Suicide estimates illustrate the importance of the comparison group. A 2024 systematic review and meta-analysis of studies from 20 countries found a suicide rate ratio of 1.76 (95% confidence interval 1.40-2.21) for female physicians compared with women in the general population. The corresponding pooled estimate for male physicians was not significantly elevated, and heterogeneity across historical periods and settings was substantial [8]. In a US analysis of 2017-2021 violent death data, female physicians also had higher suicide incidence than female nonphysicians overall (incidence rate ratio 1.53, 95% confidence interval 1.23-1.87), while the comparison for male physicians differed [9]. The early pandemic years altered both occupational exposure and population suicide patterns. None of these results means that a female physician has a higher absolute suicide rate than a male physician; relative and absolute comparisons answer different questions.

Gender also shapes exposure to nonfatal occupational illness. In a US survey, women physicians and physicians from racial and ethnic minority groups reported more mistreatment and discrimination by patients and families; those experiences were associated with burnout. After accounting for mistreatment and other covariates, a crude gender difference in burnout was attenuated [10]. Working conditions may therefore account for some of the difference, although a survey taken at one point in time cannot establish that explanation. Gender harassment, unequal domestic labour, fewer supportive senior relationships, and reduced control over work may operate alongside clinical exposures. Measures that record only a binary sex field miss pregnancy status, caregiving, gender identity, and the circumstances of minoritised clinicians.

Reproductive and family health

Pregnancy and reproductive health bring practical questions about how clinical work is organised and whether reasonable adjustments are available. A US survey of surgeons reported major pregnancy complications in 48.3% of responding female surgeons versus 27.2% of female nonsurgeon partners; the adjusted odds ratio was 1.72 (95% confidence interval 1.11-2.66) [11]. Delayed childbearing, time standing, operating room hazards, long hours, and difficulties obtaining cover are plausible contributors. Yet recruitment through professional societies and social media, retrospective reporting, and selection of respondents with children limit causal interpretation and generalisability. A high reported prevalence cannot be assumed for every surgical service or applied directly to obstetrics and gynaecology, anaesthesia, or nursing.

Differences among specialties

Surgery: Mortality and the limits of aggregate comparisons

The 2023 US analysis found a 56% higher adjusted mortality rate among surgeons than nonsurgeon physicians (rate ratio 1.56, 95% confidence interval 1.36-1.78) [2]. Comparing doctors with doctors reduces some socioeconomic differences, but the study used one year of death certificates and estimated occupational denominators. It cannot establish whether operating, emergency work, selection into surgery, or other factors explain the difference. Nor can it reliably rank individual surgical specialties. The reported 224 surgeon deaths are too few for extensive subdivision by field, grade, gender, and cause. Replication through linked professional registries is needed.

Evidence on surgical morbidity is more detailed. A review of 21 studies involving 5,828 surgeons and interventionalists documented substantial musculoskeletal disease, including cervical and lumbar degeneration, rotator cuff pathology, and carpal tunnel syndrome [12]. Sustained posture, repetitive movement, instrument handling, and protective equipment offer plausible mechanisms. However, reported pain, diagnosed disease, disability, and career-ending injury are different outcomes. Their prevalence should not be compared without matching definitions and observation periods. These findings need to be distinguished from exposures whose long-term consequences remain uncertain.

General, colorectal, and emergency surgery

Large national surveys provide evidence about the general surgery training environment. A near-complete national survey of 7,409 US general surgery residents found frequent discrimination, abuse, and sexual harassment, associated with burnout and suicidal thoughts [13]. Women reported particular burdens of gender discrimination and sexual harassment. The design cannot prove that mistreatment caused psychiatric illness, but its breadth indicates that these experiences extend beyond isolated incidents. Supervision and seniority therefore matter through relationships as well as hours: the person responsible for a trainee's development may also control whether reporting feels safe.

A separate survey of 7,391 general surgery residents found that 34.7% reported nodding off while driving and 5.0% reported a motor vehicle crash in the preceding six months. Hazardous driving was associated with more frequent duty-hour violations [14]. These are self-reported events, not fatality rates, and unmeasured factors could contribute. Nevertheless, safe travel after call deserves attention alongside rest within hospital.

Colorectal, upper gastrointestinal, hepatopancreatobiliary, trauma, and emergency surgery share aspects of this training pathway but differ in practice. Long pelvic or abdominal procedures may involve sustained neck and trunk positions; emergency services add unpredictable operating and recovery time. Current evidence does not justify assigning colorectal or trauma surgeons a separate mortality estimate from general surgery data. Procedure duration, emergency frequency, assistant position, and access to breaks are more useful exposures to record than a specialty label alone. Senior surgeons may have greater scheduling control, while carrying cumulative injury and responsibility for complications.

Orthopaedic surgery

Orthopaedics combines precise manipulation with physically demanding positioning, instruments, and, in some procedures, fluoroscopy. A 2025 systematic search and narrative synthesis of 25 studies found reported musculoskeletal pain prevalences ranging from 51.7% to 97.0%, with neck, shoulder, and lower-back complaints prominent [15]. Differences in questionnaires, pain thresholds, and recall periods account for part of that spread; it is not a pooled estimate. Symptom burden should be distinguished from structural disease or permanent disability.

Exposure also varies within orthopaedics. Arthroplasty, fracture fixation, spinal surgery, and hand surgery impose different combinations of force, posture, and repetition. Radiation exposure needs individual dosimetry and procedure information rather than an assumption that all orthopaedic surgeons receive similar doses. Equipment should accommodate differences in stature, reach, and hand size, assessed individually rather than inferred from gender. Trainees need ergonomic instruction before discomfort becomes normalised; established surgeons need rehabilitation and modified work without automatic loss of status. These findings support occupational protection but do not demonstrate an orthopaedic mortality excess.

Neurosurgery and cardiothoracic surgery

Long operations and urgent referrals make recovery time an important concern in neurosurgery. A systematic review and meta-analysis documented burnout among both neurosurgeons and neurosurgical residents, although estimates depended on the contributing samples and instruments [16]. Resident and consultant experiences cannot be reduced to a single rate: limited control, examinations, and training demands differ from independent responsibility and accumulated exposure. Burnout findings do not establish rates of depression, suicide, cardiovascular disease, or premature death. Prospective studies should measure these outcomes directly and retain surgeons who leave practice.

Cardiothoracic surgery has a related but distinct evidence base. A 2025 systematic review examined career satisfaction, quality of life, work-life balance, attrition, burnout, and mental health among surgeons, residents, and fellows [17]. The findings concern job demands and resources; they do not establish mortality differences. Emergency cover, lengthy procedures, and responsibility for critically ill patients should be studied alongside autonomy, team support, and predictable recovery. For both fields, apparently successful senior careers can conceal reduced operating capacity or persistent pain. Survival in practice is an incomplete measure of health, especially when an injured surgeon has already withdrawn from demanding cases.

Vascular and endovascular surgery

Vascular surgeons may alternate between open operating and fluoroscopically guided procedures, with different postural and radiation exposures. In a survey with a 24.2% response rate, physical discomfort correlated with burnout and lower professional satisfaction; only 4.4% reported pain to their institutions [18]. Selection and simultaneous measurement prevent causal conclusions, but the reporting gap matters: institutional injury records may capture a small fraction of symptoms.

Lead garments, fixed positioning, screen placement, and procedure duration deserve separate assessment. The relationship between pain and burnout may run in either direction, or reflect a demanding workload that affects both. Radiation-associated cancer cannot be

inferred from pain surveys or from aggregate surgeon deaths. Longitudinal dosimetry, cancer incidence, latency, and work history are required. Pregnancy adjustments and access to protective equipment must be planned before an individual has to negotiate them during a busy service.

Urology and minimally invasive surgery

Endourology places repetitive demands on the hands and upper limbs, while laparoscopy introduces instrument angles and monitor-dependent posture. In an international questionnaire study of 285 urologists, 86.0% reported musculoskeletal complaints during the preceding year; endourology and laparoscopy were associated with chronic complaints [19]. The convenience sample and self-reported attribution limit generalisation. Smaller patient incisions do not necessarily entail less physical strain for the operator.

Robotic systems change where and how the surgeon works, but their effect on career-long disability requires evidence rather than presumption. Console adjustment, supported posture, instrument handling, and switching between operative roles should be assessed in actual practice. Grade comparisons must account for case volume and procedure mix: a resident assisting repeatedly at the bedside has different exposure from the consultant at the console. Sex and gender comparisons similarly require measurements of equipment fit and workload. Available morbidity studies provide no dependable urological mortality estimate.

Otolaryngology, ophthalmology, and plastic surgery

Elective practice in these specialties still entails considerable physical demands. A systematic review and meta-analysis in otolaryngology estimated work-related musculoskeletal disorders in 79% of general otolaryngologists, with neck and back symptoms frequent [20]. Between-study differences and self-report limit the precision of the pooled figure. Microscope use, endoscopy, and sustained head position require attention even during relatively short procedures; short tasks repeated throughout a list can produce substantial cumulative exposure.

In a comparative survey, eye-care physicians reported more neck, hand, and lower-back symptoms than family physicians [21]. The eye-care sample included optometrists as well as ophthalmologists, so its results cannot be assigned exclusively to ophthalmic surgeons. Slit-lamp work and operative microscope posture also differ, making task-specific assessment necessary. Seniority may influence accumulated symptoms, while working height and equipment adjustment affect clinicians across grades.

A plastic surgery review identified cervical disease and reports of musculoskeletal problems resulting in surgery, reduced productivity, or early retirement [22]. Its evidence included small observational studies and case reports. Reconstructive microsurgery, hand surgery, burns, and aesthetic practice should therefore not be treated as interchangeable. Prolonged fine work may impose a different burden from emergency reconstruction. Across these fields, the convincing concern is physical morbidity; claims of specialty-specific excess cancer or mortality remain unsupported by these studies.

Obstetrics and gynaecology

Obstetrics and gynaecology belongs within the surgical comparison while retaining its distinctive maternity context. Operative gynaecology shares postural and instrument demands with other pelvic surgery, whereas obstetrics adds urgent decision-making, night work, and traumatic maternal or neonatal outcomes. The UK INDIGO study received 1,095 responses from 6,300 invited fellows, members, and trainees. Among respondents reporting work-related trauma, 18% of both consultants and trainees had clinically significant post-traumatic stress symptoms [23]. These were screening findings rather than independently confirmed diagnoses, and the low response rate leaves substantial selection uncertainty. Similar proportions across grades challenge the assumption that experience alone prevents psychological injury.

The health of the clinician during their own pregnancy is a separate question from distress after a patient's adverse outcome. Evidence on pregnancy complications in female surgeons supports examination of working hours, delayed childbearing, and workplace adjustments [11], but cannot provide an obstetrics-specific rate. The historical British consultant cohort's accidental poisoning finding in male obstetricians and gynaecologists involved few events [3]. It should not be presented as a contemporary risk estimate. Prevention in maternity services requires confidential treatment after trauma, fair investigation of adverse outcomes, workable pregnancy adjustments, and cover that enables both trainees and consultants to obtain care.

Anaesthesia, psychiatry, and access to medicines

Anaesthesia combines acute physiological responsibility, out-of-hours work, isolation at times, and access to potent drugs. A US longitudinal comparison reported higher suicide and drug-related death among anaesthesiologists than among internists [24]. In a British study of doctors' suicides, anaesthetists, community health doctors, general practitioners, and psychiatrists had higher rates than general hospital physicians, while there was no clear seniority difference [25]. These older findings deserve attention but should not be presented as a contemporary global ranking. Practice models, drug controls, workforce composition, and suicide classification have changed.

The newer US trainee analysis identified concerning patterns across the 22-year period, including 10 suicides and 19 accidental overdose deaths in anaesthesiology residents, as well as 10 pathology resident suicides [7]. Counts are small and must be considered alongside specialty-specific person-years and uncertainty. Accidental poisoning and suicide require different coding, prevention, and investigation even when access to medicines is a common pathway. Secure medication systems, diversion detection that allows early treatment, and confidential substance use care are practical responses. Fear of disciplinary consequences may discourage disclosure and delay treatment.

Psychiatry has sometimes shown excess mortality or particular cause patterns in historical cohorts. In the British consultant study, psychiatrists had modestly higher all-cause and ischaemic heart disease mortality than all consultants, with a higher injury and poisoning ratio [3]. The 2025 resident analysis also reported a relatively high overall rate for psychiatry trainees and a neoplastic disease signal based on few deaths [7]. These findings do not establish an occupational cause of cancer. Patient contact, career selection, age distribution, and chance must be examined separately. Similarly, professional expertise in psychiatric diagnosis does not immunise clinicians against their own depression.

Emergency medicine, critical care, and primary care

Emergency and critical care services may combine crowding, night work, violence, and repeated exposure to death. Primary care entails continuity, heavy administrative work, and limited control over demand. National surveys find substantial variation in burnout by specialty, but relative positions change with survey year, definitions, and service conditions [26]. These exposure profiles help identify prevention priorities; they do not establish distinctive mortality rates. Burnout cannot substitute for suicide or all-cause death. Safe staffing, recovery after difficult incidents, and accessible treatment are relevant across these services, with local evaluation needed to establish their effects.

Nurses, technicians, and support staff

Physician studies represent only part of the healthcare workforce. In a US cohort linking a national community survey to death records through 2019, adjusted suicide hazards relative to nonhealthcare workers were higher for health support workers (hazard ratio 1.81), registered nurses (1.64), and health technicians (1.39). The corresponding estimate for physicians, 1.11, had a wide confidence interval including no increase [27]. These occupational groups differed in gender composition, income, and employment security. Statistical adjustment cannot remove every difference between them. The defined population and inclusion of lower-paid workers broaden the relevance of these findings. It argues against allocating prevention solely to doctors or treating nonphysician clinicians as a homogeneous control group.

Infection also affects staff across professional boundaries. During the first pandemic year in England and Wales, occupational mortality surveillance found higher age-standardised COVID-19 death rates among nurses and nursing auxiliaries, with clear sex differences; the estimates were affected by community transmission, ethnicity, exposure outside work, and death certificate occupation [28]. A Scottish linkage cohort found higher hospital admission risk for patient-facing healthcare workers than the general working-age population, while nonpatient-facing workers did not show the same pattern after adjustment [29]. These findings support an exposure gradient without assigning each infection to a particular encounter. They also demonstrate that grade alone cannot describe risk: the protection available to a junior doctor, nurse, porter, or home care worker depends on the tasks performed and the environment in which those tasks occur.

Nonfatal illness and occupational injury

Mental illness and burnout

Depression and anxiety are illnesses; burnout is an occupational syndrome defined by exhaustion, cynicism or depersonalisation, and reduced efficacy. They may coexist, but prevention and clinical treatment are not identical. The resident meta-analysis found a high prevalence of symptoms with substantial measurement heterogeneity [5]. Repeated US physician surveys indicate that burnout has changed over time and varies by specialty, suggesting that changing working conditions contribute to the burden [26]. Cross-sectional surveys cannot determine whether burnout preceded illness, whether unwell people left the workforce, or how many affected clinicians received treatment.

Infection, injury, and violence

Blood-borne infection, tuberculosis, respiratory viruses, needlestick injuries, lifting injuries, and assault have distinct pathways and prevention measures. The pandemic made variation in patient-facing exposure unusually visible [28,29], but ordinary occupational infection control must continue between emergencies. Musculoskeletal disease in proceduralists is already supported by more direct morbidity data [12]. Violence can occur in emergency departments, mental health settings, maternity care, and home visits, often without systematic recording. Underreporting is likely where abuse is normalised or reporting appears futile. Local incident registries should record occupation, grade, place, mechanism, and consequences, including psychological injury, while enabling practical environmental responses. Aggregating every event into a single “clinician wellbeing” indicator would hide the interventions that work for each hazard.

Cancer and chronic disease

Cancer and cardiovascular disease account for substantial deaths in clinicians, especially with age, but the fact that a disease occurs after years of practice does not establish occupational causation. The British consultant cohort found markedly low smoking-related mortality [3]. The recent US analysis reported neoplasms and heart disease as major contributors to racial and sex inequalities within physicians [1]. Differential screening, reproductive history, smoking, metabolic health, access to timely care, environmental exposure, and survival after diagnosis are possible explanations requiring direct data. Historical radiological and operating room exposures should be assessed by era. A registry linking occupational history, exposure, incidence, stage at diagnosis, and death would tell us much more than a table of cause of death by job title.

Preventing illness and avoidable deaths

Surveillance should link profession, specialty, grade, clinical duties, hours, night shifts, job changes, and time at risk with diagnosed illness, injury, disability, and cause-specific death. Analyses need age adjustment, appropriate comparators, absolute rates, and confidence intervals. Sex, gender, pregnancy, ethnicity, and socioeconomic circumstances should be recorded carefully rather than treated as interchangeable explanations. Follow-up must include clinicians on leave and those who leave practice. Privacy protections are essential: surveillance intended to improve health must not become a route to employment retaliation.

Several practical changes are justified by the evidence already available. Training transitions warrant proactive, confidential routes to assessment and treatment. Rotas should provide adequate recovery, realistic staffing, and reliable cover for illness or pregnancy. Procedural services need ergonomics and exposure monitoring. Anaesthesia services need medication security together with nonpunitive treatment pathways. Frontline units need violence prevention and infection control tailored to patient-facing tasks. Senior doctors need accessible care independent of line management and routes for support after serious incidents. Support staff require the same seriousness of response as the most visible medical specialties.

Confidentiality often determines whether clinicians seek help. Services should explain who can see records, what employers receive, and how current fitness to practise is assessed. A history of treatment is not equivalent to impairment. Evaluation should establish whether clinicians can use services during working hours, obtain treatment, and return safely after illness. Attendance at wellbeing events is an inadequate measure of clinical benefit.

A meta-analysis of controlled physician burnout interventions found modest benefits, with organisation-directed approaches potentially offering larger gains than clinician-directed measures alone [30]. Another review found that changes to workflow, clerical burden, electronic records, and team care could improve occupational outcomes [31]. These studies largely measured burnout, and do not establish effects on suicide or all-cause mortality. Organisations should specify the exposure being changed, measure implementation, and assess clinician health and retention over time. Confidential care remains indispensable, but it cannot substitute for altering a harmful rota or unsafe workplace.

Interpretation across health systems

The strongest denominator-based studies largely concern high-income countries. Elsewhere, grade may be closely tied to nationality, contract security, insurance, and permission to change employer. Clinicians returning abroad during illness may disappear from national follow-up. Public and private practice may impose different workloads within the same specialty. Restricting observation to active registrants also excludes some clinicians who left because of illness. International comparisons therefore require harmonised definitions and follow-up of people across changes in employment and registration.

Research Priorities and Conclusion

Four questions require further investigation. First, does the recent surgeon mortality difference persist across several years after accurate adjustment for age, sex, specialty history, socioeconomic factors, and retirement [2]? Second, how do grade transitions and cumulative hours relate to diagnosed illness and death when clinicians who leave practice are retained in follow-up [6,7]? Third, which mechanisms underlie the unexpectedly small female survival advantage and the pronounced racial inequality reported in US physicians [1]? Fourth, can changes in schedules, medication safety, reproductive support, ergonomics, violence prevention, and access to treatment reduce clinically important morbidity and mortality, rather than only survey scores? The answers need multinational cohorts as well as locally designed evaluations; a finding from a single health system cannot be assumed to apply unchanged elsewhere.

Overall survival among physicians is relatively favourable, but preventable illness and death remain substantial concerns. Most physicians do not have higher all-cause mortality than the public, and US trainees have lower overall mortality than age-matched peers [1,6,7]. Yet female physician suicide risk, the elevated suicide hazard of nurses and support workers, reproductive and musculoskeletal morbidity, infection, and the recent surgeon mortality signal demand attention [2,8,11,12,27-29]. Grade, gender, and specialty must be examined alongside the working conditions and exposures they represent. Clinicians should be able to rely on careful prevention, timely diagnosis, and compassionate treatment when they become patients themselves.

Declarations

Article type: Critical narrative special article. Search and interpretation: Selective critical synthesis of primary cohorts, occupational surveillance, and systematic reviews identified through targeted literature searches. Study designs, denominators, comparators, and uncertainty inform interpretation. No exhaustive search or formal risk-of-bias assessment was undertaken; this article is not a systematic review or meta-analysis. Author contributions, funding, conflicts of interest, and journal-specific statements: To be completed by the submitting authors before submission. No original patient data were collected for this article.

Bibliography

1. Patel VR., *et al*. "Mortality among US physicians and other health care workers". *JAMA Internal Medicine* 185.5 (2025): 563-571.
2. Patel VR., *et al*. "Mortality among surgeons in the United States". *JAMA Surgery* 160.9 (2025): 1032-1034.
3. Carpenter LM., *et al*. "Mortality of doctors in different specialties: findings from a cohort of 20000 NHS hospital consultants". *Occupational and Environmental Medicine* 54.6 (1997): 388-395.
4. Rotenstein LS., *et al*. "Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis". *Journal of the American Medical Association* 316.21 (2016): 2214-2236.
5. Mata DA., *et al*. "Prevalence of depression and depressive symptoms among resident physicians: a systematic review and meta-analysis". *Journal of the American Medical Association* 314.22 (2015): 2373-2383.
6. Yaghmour NA., *et al*. "Causes of death of residents in ACGME-accredited programs 2000 through 2014: implications for the learning environment". *Academic Medicine* 92.7 (2017): 976-983.
7. Yaghmour NA., *et al*. "Causes of death among US medical residents". *JAMA Network Open* 8.5 (2025): e259238.
8. Zimmermann C., *et al*. "Suicide rates among physicians compared with the general population in studies from 20 countries: gender stratified systematic review and meta-analysis". *British Medical Journal* 386 (2024): e078964.
9. Makhija H., *et al*. "National incidence of physician suicide and associated features". *JAMA Psychiatry* 82.5 (2025): 451-458.
10. Dyrbye LN., *et al*. "Physicians' experiences with mistreatment and discrimination by patients, families, and visitors and association with burnout". *JAMA Network Open* 5.5 (2022): e2213080.
11. Rangel EL., *et al*. "Incidence of infertility and pregnancy complications in US female surgeons". *JAMA Surgery* 156.10 (2021): 905-915.
12. Epstein S., *et al*. "Prevalence of work-related musculoskeletal disorders among surgeons and interventionalists: a systematic review and meta-analysis". *JAMA Surgery* 153.2 (2018): e174947.
13. Hu YY., *et al*. "Discrimination, abuse, harassment, and burnout in surgical residency training". *New England Journal of Medicine* 381.18 (2019): 1741-1752.
14. Schlick CJR., *et al*. "A national survey of motor vehicle crashes among general surgery residents". *Annals of Surgery* 274.6 (2021): 1001-1008.
15. Richard J., *et al*. "Work-related musculoskeletal pain among orthopaedic surgeons: a systematic literature search and narrative synthesis". *Journal of Clinical Orthopaedics and Trauma* 66 (2025): 102984.

16. Zaed I., *et al*. "Burnout among neurosurgeons and residents in neurosurgery: a systematic review and meta-analysis of the literature". *World Neurosurgery* 143 (2020): e529-e534.

17. Langmuur SJJ., *et al*. "Sustainable employability in cardiothoracic surgery: a systematic review identifying job demands and resources". *European Journal of Cardio-Thoracic Surgery* 67.9 (2025): ezaf275.

18. Davila VJ., *et al*. "Physical discomfort, professional satisfaction, and burnout in vascular surgeons". *Journal of Vascular Surgery* 70.3 (2019): 913-920.e2.

19. Tjiam IM., *et al*. "Ergonomics in endourology and laparoscopy: an overview of musculoskeletal problems in urology". *Journal of Endourology* 28.5 (2014): 605-611.

20. Ryan MT., *et al*. "Ergonomics in otolaryngology: a systematic review and meta-analysis". *Laryngoscope* 133.3 (2023): 467-475.

21. Kitzmann AS., *et al*. "A survey study of musculoskeletal disorders among eye care physicians compared with family medicine physicians". *Ophthalmology* 119.2 (2012): 213-220.

22. Epstein S., *et al*. "Work-related musculoskeletal disorders among plastic surgeons: a systematic review". *Journal of Reconstructive Microsurgery* 34.8 (2018): 553-562.

23. Slade P., *et al*. "Work-related post-traumatic stress symptoms in obstetricians and gynaecologists: findings from INDIGO, a mixed-methods study with a cross-sectional survey and in-depth interviews". *BJOG: An International Journal of Obstetrics and Gynaecology* 127.5 (2020): 600-608.

24. Alexander BH., *et al*. "Cause-specific mortality risks of anesthesiologists". *Anesthesiology* 93.4 (2000): 922-930.

25. Hawton K., *et al*. "Suicide in doctors: a study of risk according to gender, seniority and specialty in medical practitioners in England and Wales, 1979-1995". *Journal of Epidemiology and Community Health* 55.5 (2001): 296-300.

26. Shanafelt TD., *et al*. "Changes in burnout and satisfaction with work-life integration in physicians and the general US working population between 2011 and 2023". *Mayo Clinic Proceedings* 100.7 (2025): 1142-1158.

27. Olfson M., *et al*. "Suicide risks of health care workers in the US". *Journal of the American Medical Association* 330.12 (2023): 1161-1166.

28. Office for National Statistics. Coronavirus (COVID-19) related deaths by occupation, England and Wales: deaths registered between 9 March and 28 December 2020 [Internet]. London: ONS (2021).

29. Shah ASV., *et al*. "Risk of hospital admission with coronavirus disease 2019 in healthcare workers and their households: nationwide linkage cohort study". *British Medical Journal* 371 (2020): m3582.

30. Panagioti M., *et al*. "Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis". *JAMA Internal Medicine* 177.2 (2017): 195-205.

31. DeChant PF., *et al*. "Effect of organization-directed workplace interventions on physician burnout: a systematic review". *Mayo Clinic Proceedings: Innovations, Quality and Outcomes* 3.4 (2019): 384-408.

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