

SECTOR IN-DEPTH

5 March 2024



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Macroeconomics – US

Population aging risks reigniting US labor market shortages, especially in healthcare

[Widespread labor shortages](#) that followed the pandemic have eased in the [US](#) (Aaa negative), but lessons learned from them will prove useful as the population ages and more workers retire from a labor market with fewer new entrants. As this “gray transition” advances, new imbalances between labor demand and supply, as well as new wage pressures, will likely emerge in a more gradual but enduring way, especially in the healthcare services industry.

» **Aging demographics will transform the labor market and foment labor frictions.**

Lower fertility and longer life expectancy will push the share of the US population that is 65 and older to 21% by 2031, up from 17% in 2023 and 12% in 2000. Imbalances are likely to emerge as retirements tighten labor supply and skill mismatches and other impediments slow the movement of workers into expanding industries, kindling wage pressures. Policy action and industry adaptation could mitigate the imbalance by encouraging labor force participation and immigration or boosting productivity.

» **Labor cost and availability constraints will be tightest for fast-growing, labor-intensive sectors.**

The Bureau of Labor Statistics (BLS) projects that employment in healthcare, transportation and warehousing, and professional services will expand three times faster than total job growth between 2022 and 2032. Aging, the shift to e-commerce and rising demand for information technology (IT) will raise demand for new hires in these labor-intensive sectors, rendering them vulnerable to higher labor costs and worker shortages. Conversely, comparatively weaker labor demand and intensity – in addition to greater reliance on physical capital and more easily automatable processes – will leave the mining, utilities, manufacturing and retail sectors relatively less vulnerable to labor pressures.

» **Healthcare is uniquely vulnerable to labor market shortages.**

The BLS expects the sector will add 2.1 million jobs and account for 45% of all job growth in the 10 years through 2032, the most of any industry. Ambulatory healthcare services and social assistance – led by home healthcare services, health practitioner offices and adult daycare – stand out for their labor demand and intensity. In these industries, in which labor is difficult to automate or outsource to other countries, worker pay represents 80%-90% of value added and projected hiring needs reach 30% of current employment, per our estimates, above 49% and 18%, respectively, for the private sector as a whole. Individuals and employers will likely bear the brunt of rising healthcare costs as providers and commercial insurers jockey to offset rising margin pressures.

Aging demographics will transform the labor market and foment labor frictions

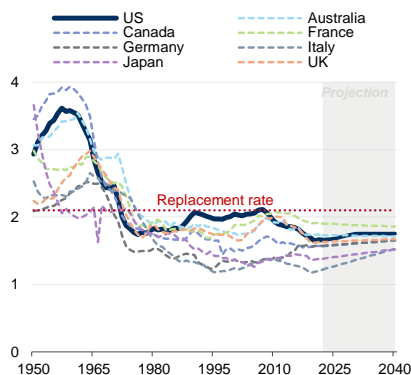
Over the next decade, aging demographics will drive permanent shifts in the demand for and supply of labor. In the absence of policy action or industry adaptation, shifting consumer demand and a leaner workforce will make hiring more difficult and costly, risking a resurgence of worker shortages in labor-intensive industries facing high demand and tight supply.

Fewer births and longer life spans will drive population aging over the next decade. The US fertility rate, a measure of the average number of children born per woman and the primary driver of population and labor force growth, has fallen over the last seventy years, especially since the deep recession of 2007-09.¹ Although demographers expect it to rise modestly from its recent record lows, it will remain below the replacement rate (2.1) – the rate required for a generation to exactly replace itself in the absence of immigration – for the foreseeable future (see Exhibit 1). When coupled with the long-term rise in US life expectancy (see Exhibit 2),² the US Census Bureau projects the 65-and-above population share to reach 21% by 2031, the year in which the last of the baby boomers reach retirement, up from 17% today and 12% at the turn of the century (see Exhibit 3).³

Exhibit 1

US fertility will remain below replacement

Fertility rate by country, children per woman



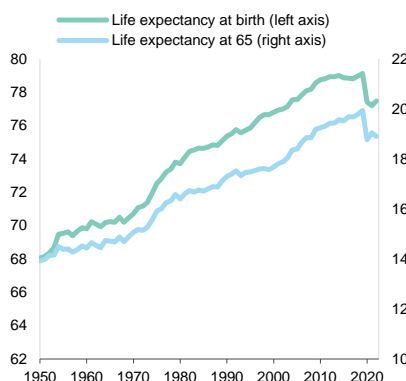
US Census projections from 2023-40

Sources: Census Bureau and Moody's Investors Service

Exhibit 2

Life expectancy has risen

Life expectancy in years

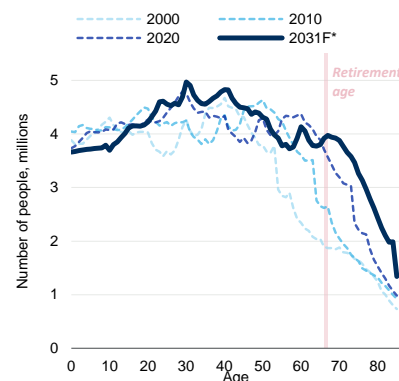


Sources: United Nations and Moody's Investors Service

Exhibit 3

The US population is getting older

Age distribution of US population



*Baby Boomers reach full retirement in 2031

Sources: Census Bureau and Moody's Investors Service

Labor market imbalances will emerge as aging and retirement tighten labor supply

Labor supply will tighten as the US population ages. According to BLS projections, the US population⁴ will grow just 0.7% annually from 2022 to 2032 — its slowest in more than 70 years — with over three-quarters of the growth driven by the population aged 65 years and older.⁵ Growth in the labor force, which tends to be constrained by population growth, will slow commensurately to just 0.4% annually over the same period, down from 0.6% in the preceding decade (see Exhibit 4). However, the share of the population employed or actively looking for work – a key gauge of labor supply known as the labor force participation rate (LFPR) – will gradually fall to 60.4% in 2032 from 62.6% last year (see Exhibit 5), as the number of younger labor force entrants diminishes and the large baby boomer cohort moves deeper into the age cohorts in which the likelihood of employment declines.⁶ If BLS projections hold, we estimate that the labor force will lose four million workers to aging between 2024-2032, or about 45% of job vacancies as of December.

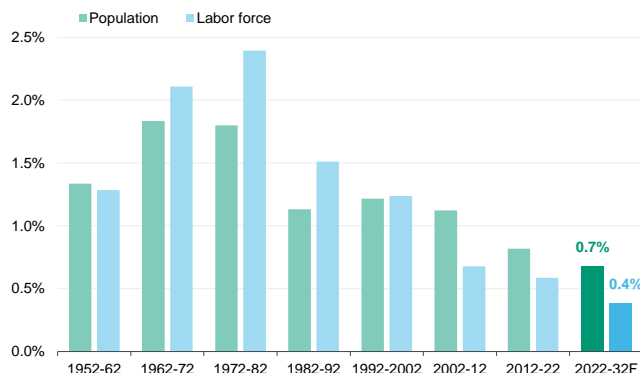
A relative tightening in labor supply risks fomenting labor market frictions and worker shortages, especially for fast-growing and labor-intensive industries. Tighter labor supply means workers will be relatively more scarce, pushing wages and turnover higher, which would pressure margins for labor-dependent industries with the greatest staffing needs (see next section for more detail). A bifurcation could gradually emerge whereby labor shortages arise in industries facing strong demand for their products, while labor surpluses surface

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in industries where demand is in relative decline. In a frictionless economy, workers would move to industries where they are most needed, but skill mismatches, geographical differences and other impediments will complicate employer-employee matching.

Exhibit 4

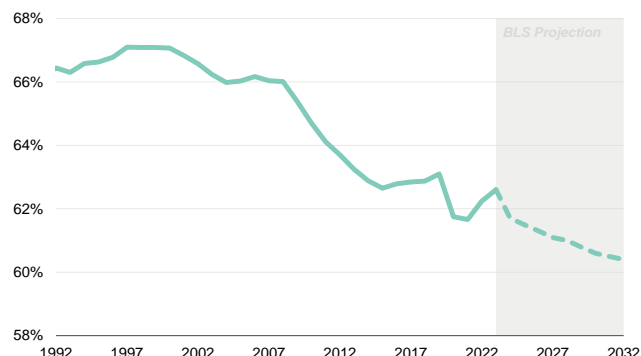
Population and labor force growth will slow further 10-year compound average annual growth rate, %



Sources: Bureau of Labor Statistics and Moody's Investors Service

Exhibit 5

An aging population and workforce will tighten labor supply Labor force participation rate (age 16+)



Sources: Bureau of Labor Statistics and Moody's Investors Service

Policy action and industry adaptation can help offset aging-related labor pressures

The US has a number of [policy options available to offset tightening labor supply](#), but political obstacles may impede their implementation.⁷ For instance, we estimate that raising the prime-age⁸ female LFPR to the median of its advanced G-20 peers⁹ would bring about three million women into the workforce, enough to offset about 75% of labor lost to aging between 2024 and 2032. However, there has been little progress in passing the structural reforms most likely to boost women's workforce participation, including paid family leave or increased funding for early child care and preschool.¹⁰ Efforts to attract migrants could also support labor supply because they tend to be younger, and have both higher fertility and workforce participation rates than nationals.¹¹ However, average annual net migration to the US declined about 5.5% between 2000-09 and 2010-19¹² and public polling suggests that any increases in large-scale immigration will likely entail domestic political pushback and implementation hurdles.¹³ Nonetheless, undocumented immigrant flows will likely continue regardless of intentional policy efforts, with many ultimately absorbed by industries in need of labor.

Optimization, technology and training could enable businesses to do more with less. Labor shortages and wage pressures should incentivize firms to make existing business practices more efficient and invest in productivity-enhancing technology, worker upskilling and education, including through more intentional collaboration with vocational schools and universities. However, some industries are better positioned than others. For instance, the use of industrial robots is common in durable manufacturing industries like autos and electronics, reflecting in part their relatively automatable processes.¹⁴ By contrast, investments in cost-cutting technology and automation will be somewhat more difficult to implement in labor-intensive industries like transportation or nursing care, where labor shortages remain significant but the applicability of automation is less straightforward.

Growing business investment in artificial intelligence (AI)¹⁵ suggests that experimentation with automation is well underway [across many industries](#). Yet, the history of earlier technological leaps into electrification and computers, which included extensive investments in new business processes, human capital and experimentation, suggests that the productivity gains associated with AI investments, even if they prove transformational, are likely still years away.¹⁶

Businesses finding it difficult to replace labor with technology might look to outsource or offshore some of their labor needs, which has been particularly common in the manufacturing and IT services industries. However, these practices are subject to the risk of political pushback and changes in immigration laws. Furthermore, some industries are difficult to offshore due to the on-site nature of the work and need for physical presence, as is the case in healthcare, transportation and construction.

Labor cost and availability constraints will be tightest for fast-growing, labor-intensive sectors

Industries most vulnerable to aging-related labor shortages will confront structurally strong labor demand from secular economic trends – like growing demand for medical services, e-commerce and information technology – and worker retirements, as well as structurally higher dependence on labor to produce goods and services. The confluence of these forces will be most acute in the healthcare, transportation and warehousing and professional services sectors, which will see labor costs rise and operating margins fall faster than other industries as they ramp up hiring to meet their labor-intensive needs. Conversely, comparatively weaker demand for their products and lower labor intensity will leave the mining, utilities, manufacturing and retail sectors comparatively less vulnerable.

Aging demographics and other secular trends will influence labor demand across industries ...

A number of secular trends in the US economy will drive shifts in industry demand for workers, but population aging will have the largest effects. According to BLS projections, aging demographics and rising chronic illness will push **healthcare and social assistance** sector employment up by nearly 10% in 2022-32, over three times the rate of total employment growth in the US economy (3.0%). In turn, the industry will represent 45% of the 4.7 million new jobs added in the period — the largest and fastest gain across all sectors — while related occupations in healthcare support and practice will account for two of every five new jobs created.

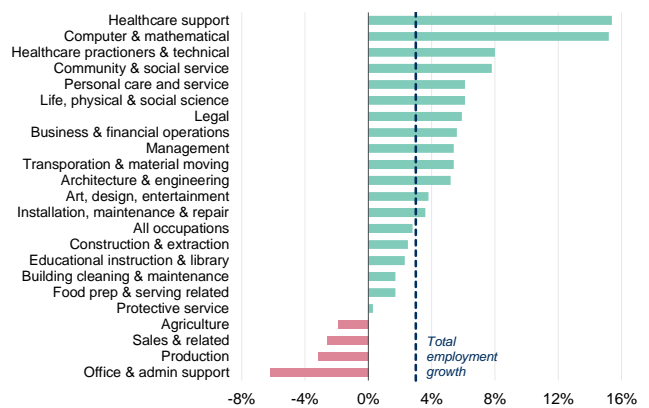
Employment in **professional, scientific and technical services**, driven by computer systems design, will also expand by a strong 9.1% and account for 21% of job gains, buoyed by rising demand for IT products and services. Meanwhile, growth in e-commerce and the digital economy will support above-average job gains in **transportation and warehousing** (up 8.6%) and **information** (6.6%), but the shift to online shopping will also dent **retail trade** (down 3.4%) employment as well as sales and related occupations. Although [industrial policies](#) and onshoring will drive [demand for battery and semiconductor manufacturing](#), total **manufacturing** employment is nonetheless expected to shrink by 0.9% over the period as manufacturers further automate to increase productivity and reduce labor needs (see Exhibits 6 and 7).¹⁷

Exhibit 6
Healthcare sector expected to lead job growth through 2032 ...
Projected change in employment by industry (2022-32)



Sources: Bureau of Labor Statistics and Moody's Investors Service

Exhibit 7
... including related occupations in healthcare support and practice
Projected change in employment by occupational group (2022-2032)



Sources: Bureau of Labor Statistics and Moody's Investors Service

... while workforce retirements further boost labor needs

The need to replace retiring employees will also drive labor demand across industries, as workforces age and fewer younger workers enter the labor force. The larger an industry's share of older workers, the more likely that companies within them are to incur higher turnover costs. These can include direct expenses related to hiring, training and overtime pay to make up for lost capacity, as well as indirect losses related to lower productivity and the potential loss of customers due to a decline in service quality. Research suggests that turnover costs tend to be substantial even under normal labor market conditions and typically amount to nearly a quarter of a worker's annual wage.¹⁸ However, they could be magnified further as labor force growth slows in the coming years and companies are compelled to replace retiring workers by sweetening compensation to attract and retain talent.

To estimate the demand for workers needed to replace retirees, we rely on the share of an industry's workforce aged 55 or older, which ranges from 13% in accommodation and food services to nearly 34% in real estate and rental leasing, though age profiles range even more widely at the subindustry level.¹⁹ Roughly one-third of the 55-and-above age cohort will transition into retirement and exit the labor force permanently over the next five years, with more than three-fifths leaving in the next decade, according to our estimates.

In Exhibit 8, we combine BLS employment projections and our estimates of older worker retirements to quantify the hiring needed to expand and replace a sector's existing workforce, which we use as a proxy for labor demand between 2022 and 2023. Assuming that retirement patterns within sectors reflect the retirement patterns of the broader economy, we estimate that hiring needs in the period will range from 10% of the 2022 food and accommodation workforce to a high 25% of the real estate and rental leasing workforce. All else equal, the greater an industry's hiring needs, the higher labor costs they will face as the labor market tightens.

Exhibit 8

Labor demand will be greatest in the real estate, healthcare and transportation and warehousing sectors

Projected hiring needs as a share of 2022 employment, by sector



Sources: Bureau of Labor Statistics and Moody's Investors Service

Healthcare, transportation and warehousing, computer systems design services are most vulnerable to worker shortages; mining, utilities, manufacturing and retail less so

Labor costs will rise as sectors expand and replenish their workforces amid a tightening labor supply, but vulnerability to labor shortages will be higher (lower) for those with higher (lower) labor intensity – the degree to which an industry relies on labor to produce goods and services. Just as energy-intensive industries are more sensitive to the price of oil, labor-intensive industries are more sensitive to the price of labor (i.e., wages). As such, the higher an industry's reliance on human capital and the lower its reliance on physical capital (i.e., machinery, technology and equipment), the quicker it will see labor costs rise and operating margins compress.

In Exhibit 9, we compare our proxies for labor demand (projected hiring needs for 2022-32) and labor intensity (worker compensation as a share of industry value added) relative to the US economy as a whole (denoted by the dotted black lines), to differentiate their vulnerability to shifting labor market dynamics.

Vulnerability to labor shortages will be highest for sectors in the upper-right quadrant, which face both greater labor demand and intensity relative to US industry as a whole. **Healthcare and social assistance** stands out for its vulnerability, with projected hiring needs and worker compensation equivalent to 25% of employment levels and 83% of the sector's added value, well above the respective 18% and 52% across all industries. As such, healthcare providers will see costs rise quicker than most industries as they hire to meet new demand and replace retirees. This could result in labor shortages if financial constraints become too strict or if the industry is unable to invest in more efficient practices or technologies. The **transportation and warehousing** sector faces a similar dynamic, though there is significant diversity among industries. For instance, labor intensity in warehousing and storage, where worker compensation accounted for about 92% of industry value added in 2017-22, is higher than the air (55%) trucking (54%), and rail (47%) transportation industries. Vulnerability for the **professional and technical services** sector is also high, but primarily driven by the computer systems design services industry, which is labor intensive and projected to grow employment over 19% between 2022-32,

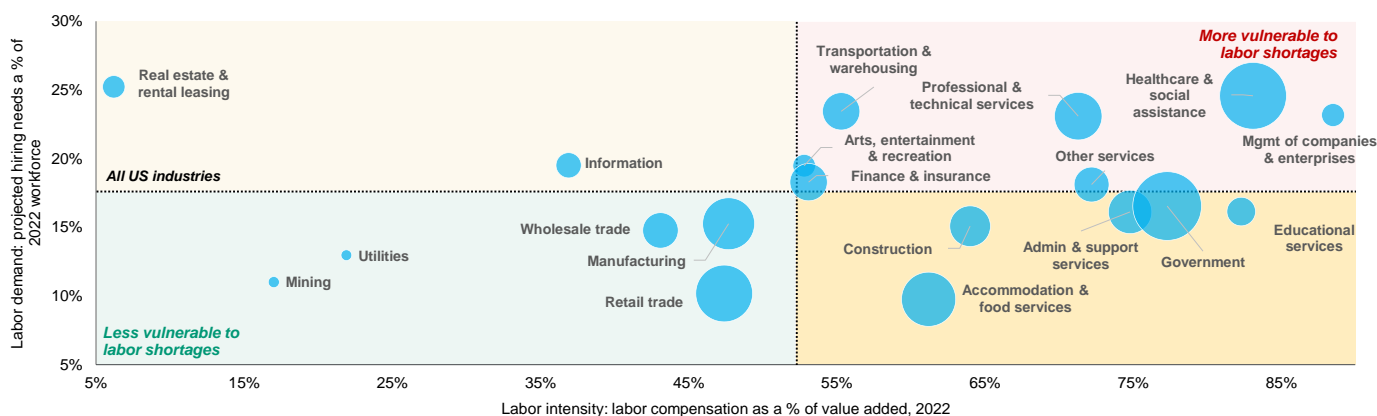
nearly seven times faster than economywide job growth. Growing business needs for customized software solutions, assistance with cloud migrations, cybersecurity services and development expertise will drive expansion across different segments of the industry. High turnover and the need for highly specialized skillsets risk further magnifying labor cost pressures, but the industry's high productivity and offshoring capacity could serve as mitigants.

Conversely, industries in the bottom-left quadrant are comparatively less vulnerable to aging-related labor shortages given their weaker demand for workers and lower labor intensity. The **mining** and **utilities** sectors have particularly low vulnerability as a result of their capital-intensive operations, limited hiring needs and relatively low labor dependence. The **retail** sector's low vulnerability is also notable given a projected 3.4% decline in employment between 2022 and 2032 and a steady decline in labor intensity over the last five years, both driven by the rise of e-commerce. Nonetheless, labor costs could still burden the sector if turnover is elevated by non-aging factors like low pay and unpredictable scheduling, which tend to be prevalent in the industry. The **manufacturing** sector's relatively low vulnerability mostly reflects a projected decline in sectoral employment as manufacturers further automate to improve production efficiency and throughput. However, notable exceptions include semiconductor and battery manufacturing, which are both labor intensive and poised for robust job growth as a result of growing demand for chip-related technology and government industrial policies designed to foster the domestic development of the [electric vehicle](#) and [clean-energy manufacturing](#) industries.²⁰

Exhibit 9

Strong labor demand and high labor intensity render healthcare and transportation sectors more vulnerable to worker shortages

Labor demand and labor intensity, by sector



Bubble size represents industry employment level in 2023.

Sources: Bureau of Labor Statistics and Moody's Investors Service

Healthcare is uniquely vulnerable to labor market shortages

The healthcare and social assistance sector's outsized labor demand and highly labor-intensive operations represent an extraordinary test of labor market dynamics going forward.²¹

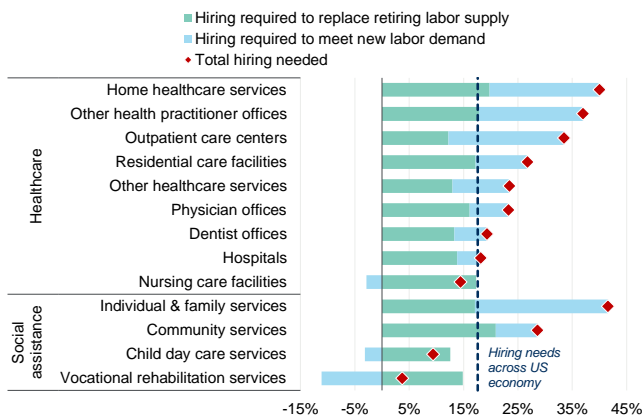
The sector's demand for labor will grow much larger as the elderly US population, which tends to have greater and more complex healthcare needs, fuels demand for its services. The BLS projects that healthcare and social assistance employment will grow by 9.7% and add 2.1 million jobs between 2022 and 2032 – about 45% of the 4.7 million added over the period – the most and fastest of any sector.²² At roughly 14% of employment, the healthcare and social assistance sector already represents the largest single source of demand for labor in the US economy, far outpacing employment in other sizable sectors like retail (10% of total), manufacturing (8%), finance (6%) and construction (5%).

Jobs in the individual and family services industry are expected to surge by 24.5% in the decade through 2023, driven by the rising number of older adults who will require long-term care in the form of adult day care and nonmedical home care. Job growth in home healthcare services is not far behind (20.2%), supported by shifting personal and policy preferences to "age in place." Consequently, most of the largest healthcare-related occupations are also poised to expand well in excess of the 3% growth rate of total employment across the US economy, led by nurse practitioners (44.5%), physician assistants (26.5%) and home health and personal care aides

(21.7%).²³ The sector's strong demand for more workers will be augmented by the need to replace its relatively older workforce, with six industries in the sector – about half of sectoral employment – boasting above-average shares of older workers.

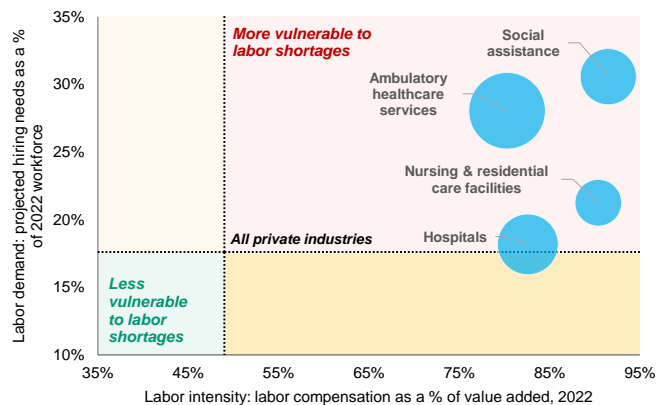
Strong labor demand and highly labor-intensive operations will render the healthcare and social assistance sector broadly vulnerable to labor shortages. In terms of labor demand, we estimate that the industries for home healthcare services, individual and family services as well as other health practitioner offices will need to hire the equivalent of 37%-42% of their 2022 staffing levels to replace retiring workers and meet growing demand for their services, more than double the rate of the broader US economy's labor needs over the same period (see Exhibit 10). With respect to labor intensity, worker compensation in the sector comprises a far higher share of industry value added compared to all private industries, ranging from about 80% in the ambulatory healthcare services industry – which includes health practitioner offices, outpatient care centers and home healthcare services – to 92% in social assistance (see Exhibit 11).

Exhibit 10
Healthcare and social assistance labor demand is strong
 Projected hiring needs as a share of 2022 employment



Projected hiring needs are for 2022-32.
 Sources: Bureau of Labor Statistics and Moody's Investors Service

Exhibit 11
The healthcare sector is broadly vulnerable to labor shortages
 Labor demand and labor intensity in healthcare and social assistance



Bubble size represents industry employment level in 2023.
 Sources: Bureau of Labor Statistics and Moody's Investors Service

Healthcare providers facing a rising labor bill will look to do more with less by optimizing existing practices and investing in productivity-enhancing technologies. Some health systems are using new staffing patterns that pair older, more experienced but less mobile nurses with predictive analytics technology that enables them to better detect illness, predict patient outcomes and utilize younger staff. [Others are investing in early-stage, AI-powered technology](#) to predict missed care opportunities and help reduce readmission risk. A number of rated physician practices, dental offices and healthcare staffing companies are [already piloting AI software](#) to automate routine tasks and potentially improve diagnostic accuracy. Meanwhile, telemedicine has the potential to reduce the number of doctor visits, tests and procedures.²⁴ However, investment costs for new technologies tend to be high and front-loaded, while benefits usually take time to materialize.

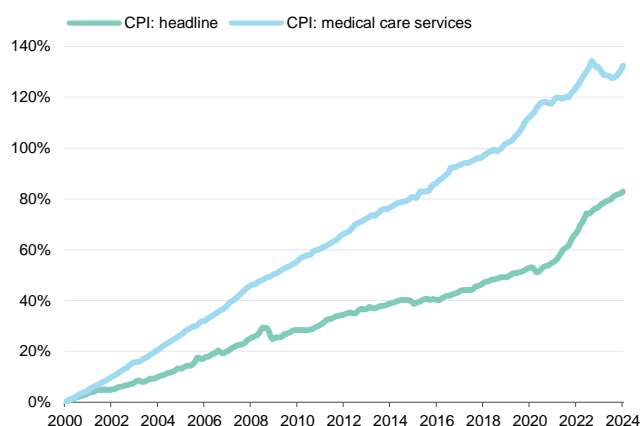
Absent productivity enhancements or cost-cutting from service providers, we expect consumers and other purchasers of healthcare – like self-insured businesses providing health insurance to employees – will bear the brunt of the sector's rising costs, labor-related or otherwise. Consumer prices for out-of-pocket spending on healthcare services²⁵ have risen 132.5% since January 2000, far faster than the 82.9% increase of all US consumer prices (see Exhibit 12). Healthcare inflation has been driven by a complex combination of [an aging population's higher utilization rates and the structure of the US healthcare system](#), including its highly fragmented delivery system, increasing consolidation and high administrative and labor costs. High information asymmetry also compounds consumer price pressures as patients are often unsure of the exact cost of a service or procedure until after it is delivered, making price comparison and informed decision-making difficult. Given the essential and less-discretionary nature of healthcare services, we would expect consumers to cut back on other discretionary spending to afford the medical services they need before rationing the quality or quantity of healthcare they receive.

Rising out-of-pocket costs for consumers will flow from tense contract negotiations between providers and insurers, which will leverage their increasingly consolidated market power to try to offset costs with one another. A growing labor bill will compound other growing expenses for healthcare providers, the larger ones of which we expect will be able to use their growing market power to partially offset rising costs by securing higher reimbursements from commercial insurers during contract renegotiations.²⁶ In turn, private insurers, especially those in highly concentrated markets,²⁷ are likely to aggressively challenge claims, tighten service coverage and boost premiums and copays to maintain margins. However, employers facing a competitive labor market may push back against insurers and higher insurance premiums. Prices paid to healthcare providers by private insurers have risen about 27.5% since 2014, slightly less than the 30.4% rise faced by consumers over the same period (see Exhibit 13).

We expect reimbursement rates from public insurers like Medicare and Medicaid to lag behind those paid by private insurers because of growing federal fiscal constraints. Federal outlays for Medicare and Medicaid grew to a combined 4.8% of GDP in fiscal 2023 (ended 30 September 2023), and accounted for 21% of spending, up from 2.5% of GDP and 14% of spending in 2000.²⁸ We expect [the US fiscal deficit to average 6.0% of GDP](#) over the near term, which will likely leave limited flexibility or appetite for increases in Medicare payment rates to healthcare providers. If Medicare's rate-setting moderates, it could have spillover effects on private providers and insurers, lowering healthcare inflation overall because private insurers often follow Medicare regulations affecting how services are reimbursed.²⁹

Exhibit 12

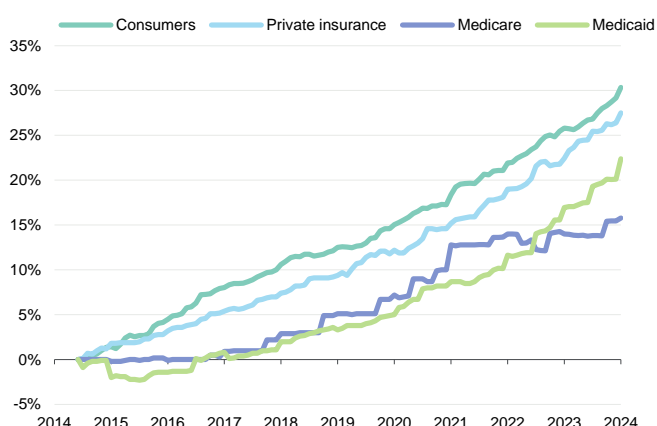
Consumer healthcare services inflation has outpaced headline CPI: headline vs. medical care services, relative to January 2000



Sources: Bureau of Labor Statistics and Moody's Investors Service

Exhibit 13

Healthcare prices paid have risen faster for consumers than insurers Prices paid to healthcare service providers, relative to June 2014



Sources: Bureau of Labor Statistics and Moody's Investors Service

Moody's related publications

Outlooks

- » [Global Macro Outlook 2024-25 \(February 2024 Update\): Growth for G-20 economies to stabilize at modestly lower levels in 2024](#), 29 February 2024
- » [Credit conditions – Global: 2024 Outlook - Adjusting to a new normal driven by rates, geopolitics and technology](#), 31 October 2023

Sector research

- » [Healthcare Quarterly: January 2024](#), 23 January 2024
- » [Hospitals – US: AI offers administrative and clinical efficiency, but poses regulatory, cyber risks](#), 24 October 2023
- » [Healthcare – North America: AI can enhance and disrupt physicians and dentists in several ways](#), 24 October 2023
- » [Pharmaceuticals – North America: AI tools will gradually enhance speed and efficiency of drug development](#), 24 October 2023

- » [Macroeconomics – US: US wage pressures decelerate despite enduring labor market strength](#), 9 October 2023
- » [ESG – US: Inflation Reduction Act provides boost to clean energy manufacturing in the US](#), 15 August 2023
- » [Macroeconomics – Advanced Economies: Labor shortages to ease this year, but they will resurface without policy action](#), 5 May 2023

Endnotes

- 1 The decline is due to a number of interrelated socioeconomic factors that range from evolving social norms (i.e., lower teen birthrates and higher educational and career attainment for women) to the lasting scars of the 2007-09 recession. See Livingston, G. & Thomas, D., 2019. [Why is the teen birthrate falling?](#) Pew Research Center. See also Schneider, Daniel. 2017. [The Great Recession Reduced Fertility among Unmarried and Teen Women](#). IRLE Policy Brief.
- 2 Gains in average life expectancy at birth began to stall in 2014, driven by increased mortality from suicide, alcoholism and overdose, issues which remain unresolved. However, life expectancy at age 65 continued to rise steadily until the onset of the pandemic.
- 3 See [2023 National Population Projections Table: Main Series](#). US Census Bureau. These projections are based on the "Main Scenario," which assume "moderate" levels of immigration.
- 4 Aged 16 and above.
- 5 See Kevin S. Dubina, "[Labor force and macroeconomic projections overview and highlights, 2022–32](#)," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, September 2023.
- 6 For example, 66% of the population aged 55-64 were employed or actively looking for work in 2023. That ratio falls to just 33% and 18% for those aged 65-69 and 70-74, respectively.
- 7 We capture these risks in a score of "3" for the Demographics category under the [Social Issuer Profile Score \(S-IPS\) for the US](#). Compared to other sovereign issuers with S-IPS scores of "4" or "5", the US' score implies some level of policy action but not full mitigation that would result in a score of "2". A Credit Impact Score of "2" indicates that the social risks are not likely to have a negative effect on the rating.
- 8 Ages 25 to 54.
- 9 According to the Organization for Economic Cooperation and Development, the US' prime-age female LFPR reached 77.4% in 2023, below the median of the advanced G-20 economies (82.5%), which include the euro area, [Japan](#) (A1 stable), [Germany](#) (Aaa stable), [UK](#) (Aa3 stable), [France](#) (Aa2 stable), [Italy](#) (Baa3 stable), [Canada](#) (Aaa stable), [Australia](#) (Aaa stable) and [Korea](#) (Aa2 stable).
- 10 See Chen, Q. et al, 2023, "[The Role of Structural Fiscal Policy on Female Labor Force Participation](#)," IMF Working Papers 23/186, International Monetary Fund.
- 11 See Peri, Giovanni. "[Immigrant Swan Song](#)." IMF Finance & Development Magazine, vol. 0057, no. 001, Mar. 2020.
- 12 Annual net migration reflects both legal and illegal migration flows.
- 13 Though public attitudes on immigration have gradually softened over the last 30 years, only 26% of Americans believed that immigration should be increased from its current level, according to [a June 2023 Gallup Poll](#) that has tracked the question since 1965. This compares to 31% of respondents that believe it should be kept at present levels and 41% that think it should be decreased.
- 14 See Tahsin Saadi Sedik, 2021. "[Pandemics and Automation: Will the Lost Jobs Come Back?](#)," IMF Working Papers 2021/011, International Monetary Fund.
- 15 See [Artificial Intelligence Index Report 2023](#). Stanford Institute for Human-Centered Artificial Intelligence. Figure 4.2.12. Private investment in AI reached \$47.4 billion, almost triple its inflation-adjusted annual average in 2010-19 (\$16.6 billion).
- 16 See Brynjolfsson, E. et al. (2018). [The productivity J-Curve: How intangibles complement general purpose technologies](#). Also see David, P. A. (1990). [The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox](#). The American Economic Review, 80(2), 355–361.
- 17 Javier Colato and Lindsey Ice, "[Industry and occupational employment projections overview and highlights, 2022–32](#)," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, October 2023.
- 18 Bahn, K. & Cumming C. S., 2020. [Improving U.S. labor standards and the quality of jobs to reduce the costs of employee turnover to U.S. companies](#). Washington Center for Equitable Growth. The authors conduct a meta-analysis of 31 case studies in 14 research articles published between 2000 and 2020 and find that the median cost of turnover represented 23.5% of the vacated position's annual wage.
- 19 Across all 292 industries, "shoe stores" have the lowest share of workers aged 55 and above (4.7%) while "sewing, needlework and piece goods stores" have the highest (53.7%). Notably, both of these subindustries are housed under the broader retail trade sector, highlighting the age diversity that can be found within industries.
- 20 The BLS estimates that semiconductor manufacturing employment will grow by a robust 8.0% between 2022-32. The "other electrical equipment and component manufacturing industry," which includes battery manufacturing, is projected to have the fastest employment growth of any manufacturing industry (34.6% between 2022-32) and is projected to be the fifth-fastest-growing industry overall.
- 21 We capture these risks in the Human Capital category score under the S-IPS. For non-profit healthcare, we have typically assigned scores of 3 (moderate exposure) and 4 (high exposure). [Scores of 5 are far less common across Global MIS](#), typically corresponding to very severe issuer-specific situations involving severe labor relations challenges, work stoppages, and instances where even higher-cost alternatives, e.g., travel nurses for healthcare issuers, are impractical or unavailable.

[22](#) Javier Colato and Lindsey Ice, "[Industry and occupational employment projections overview and highlights, 2022–32](#)," Monthly Labor Review, U.S. Bureau of Labor Statistics, October 2023.

[23](#) Ibid.

[24](#) Nearly one-in-four people reported having a remote visit with a healthcare provider in 2021, according to a [Department of Health and Human Services](#) survey. However, other [survey findings from McKinsey](#) suggest telemedicine penetration was concentrated in psychiatric and substance use disorder treatment.

[25](#) Out-of-pocket consumer expenditures for healthcare services include prices paid to healthcare providers for medical services. These expenditures include copays, deductibles, coinsurance and the cost of uninsured medical services.

[26](#) See Kaiser Family Foundation. [What We Know About Provider Consolidation](#). A large and growing body of research suggests that vertical integration among hospitals and physician offices has played an important role in increasing their bargaining power with insurers, enabling volume shifts from lower-cost to higher-cost treatment settings and higher repayment rates.

[27](#) See American Medical Association Division of Economic and Health Policy Research, [Competition in Health Insurance: A Comprehensive Study of U.S. Markets](#), 2023. The study finds that 73% of metro area commercial insurance market are highly concentrated, with 48% of markets featuring one insurer holding at least 50% of market share, restricting competition and enhancing bargaining power with providers.

[28](#) Medicare spending is net of offsetting receipts.

[29](#) See Barnett. M. 2020. [Common Practice: Spillovers from Medicare on Private Health Care](#). NBER WP 27270. National Bureau of Economic Research.

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