



KSA Occupations Review

Kingdom of Saudi Arabia
2023



KSA Occupations Review

The Future of Occupations

2023

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About NLO

“The NLO is the Kingdom of Saudi Arabia’s labor observatory and is the leading and trusted source for labor market data and insights in the Kingdom. Its mandate is to support entities, experts, and beneficiaries to enable them to make informed decisions and formulate policies based on labor market reports and data-driven research insights.”

National Labor Observatory

Riyadh – Kingdom of Saudi Arabia

Executive Summary

The KSA Occupations Review report provides analyses on labor market trends relating to:

- The current occupational picture
- Changes in occupational structure between 2016 and 2022
- The future direction of the occupational structure

On a global scale the nature of jobs is undergoing a technological revolution, where the rise of AI and automation present both huge opportunities and threats to the occupational structure as we know it today. The Saudi labor market is no exception to this technological change, on the contrary, the Saudi economy seems positioned to be an early mover in the adoption of AI and automation technologies.

The changing labor market places a high demand on governments, employers and the labor force globally. Governments need to monitor the development of occupations and the labor force closely, as well as implement policies that respond to the changing labor market picture.

This report will present historical occupational trends of the Saudi labor market up to today to detect patterns over time that can tell us something about the future. Key historical trends for the future of jobs include:

The working population of Saudi Arabia is increasingly younger than before. Active labor market policies will be key to absorbing young workers into the Saudi labor market to reap the benefits of the demographic dividend the young population of Saudi Arabia represents.

Saudi workers are increasingly entering high skilled occupations. The Saudi labor force has moved from lower-skilled to higher-skilled occupations rapidly. The Saudi labor force is increasingly working in professional, managerial, and technical occupations at the expense of lower-skilled professions.

Executive Summary

Private sector is growing and the share of Saudi workers in this sector is rising sharply. The Saudi labor force has made a significant switch from public to the private sector, and women workers almost trebled their share in the private sector between 2016 and today.

High-skilled occupations in the technology industry are in high-demand. IT occupations in the professional occupation category rank among the top ten occupations that experienced the highest wage increase between 2016 and 2022, reflecting how the rapid technological changes and artificial intelligence will influence the labor market in the years to come.

Saudi transformation programs are evident in the rise of occupations key sectors. Occupations in key sectors such as health, the arts, infrastructure, manufacturing, and mining sectors have seen a significant increase in wages over time, mirroring the ambitions of the Vision 2030 and the Saudi transformation programs.

Introduction

The KSA Occupations Review report highlights trends in employment, education, skills, and wages across occupations in KSA for the benefit of policy makers and the public. By using historical data, the report tracks trends over time, which in turn are at the foundation for predictions for the future labor market occupations outlook. Both historical and current analyses are key to monitoring and informing labor market policies for the future.

The KSA labour market has several vital characteristics that underpin the analysis:

- The demographic dividend of a young and educated population
- Saudization policies
- Diversification policies with an emphasis on green economy and tourism sector
- A growing manufacturing sector

Globally occupations are changing. There are several dynamic issues labor markets must adapt to, including:

- Artificial intelligence and jobs automation.
- Education and skills related to the both the technical and the green transformation
- Labor market shortages in key welfare sectors including in the health and education sectors

Taking these factors into account is crucial in the analysis, because by understanding labor market trends we can develop more precise and targeted labor market policies for the future.

KSA government policies and measures include:

- Incentives for education, training and skills development.
- Saudization policies.
- Gender policies.
- Active labor market policies.
- Entrepreneurship policies.
- The establishment of manufacturing industries and jobs.

Introduction

We need to understand this complex landscape and its different drivers to be able to adapt to future labor market demands. Future demands are connected to rapid technological changes, including AI and automation and a need to be equipped for the green revolution. Other key functions in health and education sectors need to be filled in parallel. There are in other words several demands on governments and labor market stakeholders, including the education and skills sectors, to calibrate this complex picture to the best outcomes for the country and its people.

This report presents in its first section a brief overview picture of the key driving forces behind the changing KSA labor market. In “Where are we now”, a brief overview of key labor market statistics aims to give you a platform from which to understand the further analysis. The further analysis is first presented as historical analysis, tracking developments from 2016 until today in the section “Where have we been”. In the last section, “Where do we go from here”, the future of jobs is outlined.

The changing labor market of KSA

The dual labor market of an oil economy combined with a much smaller manufacturing and service industry has characterized KSA until recently. However, a very significant economic change is happening for several reasons:

- Diversification of the economy: The Saudi Vision 2030 is leading the country to a transformation in its economic structure. To become less reliant upon oil, the Vision lays out plans for a diversified economic future.
- Entrepreneurship and investments: To attract foreign investment and to facilitate entrepreneurship are central aims in the economic transition.
- Growing the services industries: Tourism, health and education sectors, alongside the technology sector as a part of services including e-government services, are highly prioritized areas of focus.
- Investment in manufacturing and renewable energy sectors: Petrochemicals, renewable energy, and advanced manufacturing are developed in tandem with attracting increased investment to build a robust industrial base in KSA.

The implementation of the Vision 2030 through several dedicated programs is changing KSA society and labor market significantly. This transformation is also reflected in international rankings as presented in (Box 1).

In the World Bank's *Ease of Doing Business rankings*, KSA secured a spot at 62 out of 190 economies in 2020. KSA's score has increased substantially over time.

KSA scores 80 % in the World Bank's *Women, business and the law report* of 2022. For laws relating to for example women's pay, or constraints on women starting a business, KSA gets a top score, whereas there is room for improvement in laws affecting women's work after having children.

Source: Ease of doing business, Saudi Arabia, World Bank (2020); Women, business, and the law, Saudi Arabia, World Bank (2022)

Box 1: International rankings relating to the KSA business environment

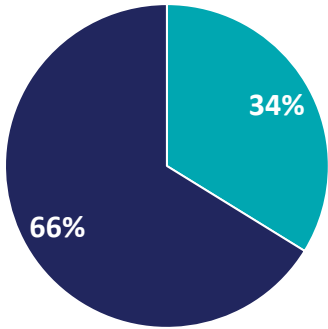
In this report we ask, what are the implications of this transformation on the Saudi labor market? How does this change the nature of jobs, and what are the implications for government, workers and the public?

To answer these questions, there are several dynamics that need to be monitored, including:

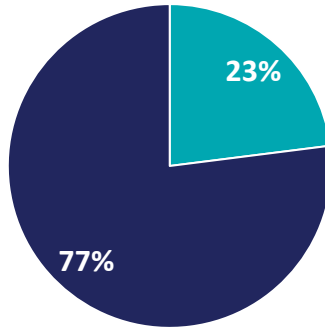
- Increased demand for workers with expertise in technology, innovation, data analytics, and customer service: Following an increase in high-value-added jobs in the country, there will be shifts in the required skill sets. There is a growing need for professionals with adaptable skill sets in a rapidly changing job market
- A need to address skills gaps and enhance the employability of the workforce: Continued investments in upskilling and reskilling programs will be vital to equip the workforce with the necessary competencies for the evolving job market
- The demographic dividend – a challenge and opportunity: A large portion of KSA’s population is under the age of 30. Herein lies a huge opportunity if this pool of talent can drive innovation and entrepreneurship. The challenge is to ensure that this young workforce is adequately skilled for to enter the changing labor market in the coming years
- The supply of a young and educated labor force and more Saudis, especially women, entering the Saudi labor market is a hallmark of the Saudi transition. The increased supply of labor is a positive development that needs to be monitored to inform adaptive education and labor market policies.

KSA current labor market picture

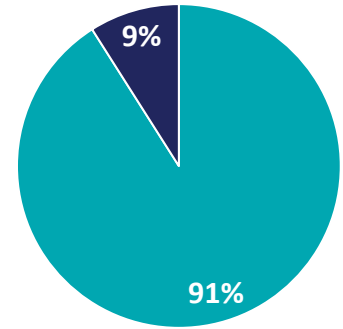
Share of Saudis and expats in employment, Q4 2022



Saudis and expats in the private sector, Q4 2022

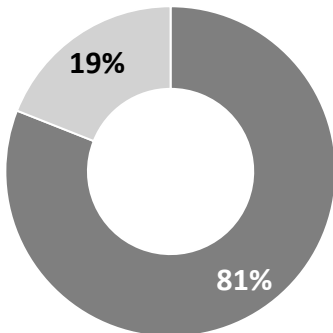


Saudis and expats in the public sector, Q4 2022

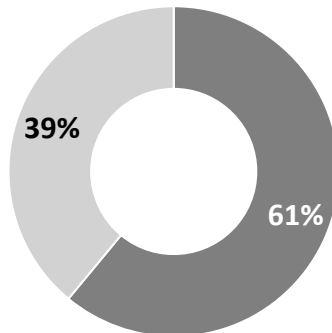


■ Saudis ■ Expats

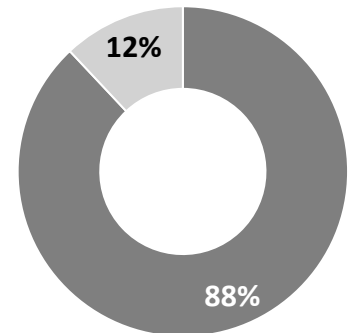
Gender distribution in employment, Q4 '22



Gender distribution in employment, Saudis, Q4 '22

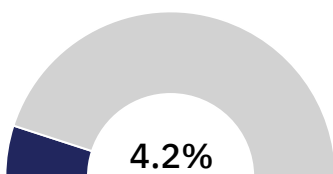


Gender distribution in employment, Expats, Q4 '22

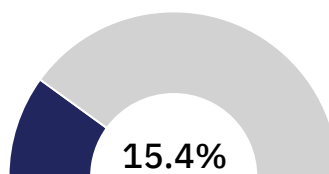


■ Males ■ Females

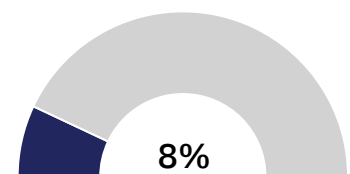
Unemployment rate, Saudi males, Q4 2022



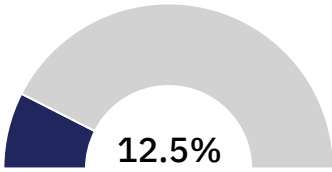
Unemployment rate, Saudi females, Q4 2022



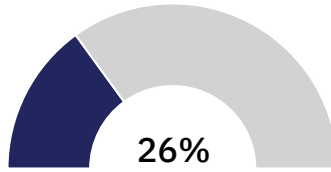
Unemployment rate, Saudi total, Q4 2022



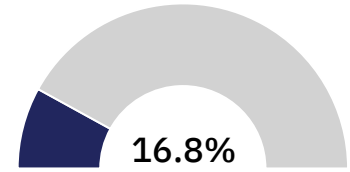
Unemployment rate
Saudi males, youth age group (15-24), Q4 2022



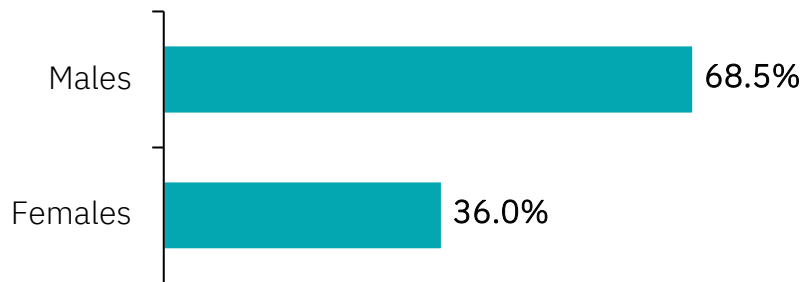
Unemployment rate
Saudi females, youth age group (15-24), Q4 2022



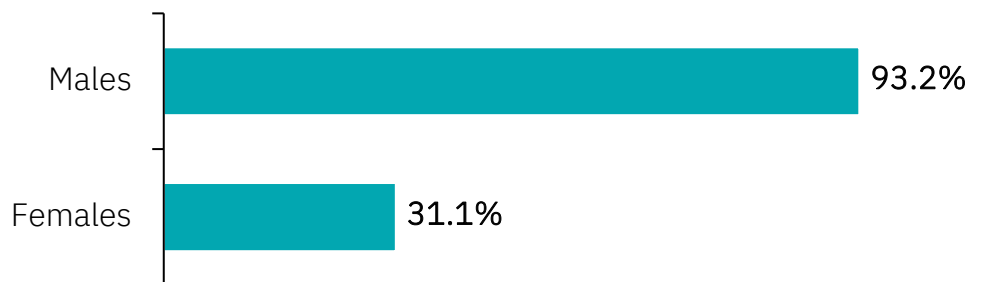
Unemployment rate
Saudi youth age group (15-24), Q4 2022



Labor force participation rate, Saudi males and females



Labor force participation rate, Expat males and females

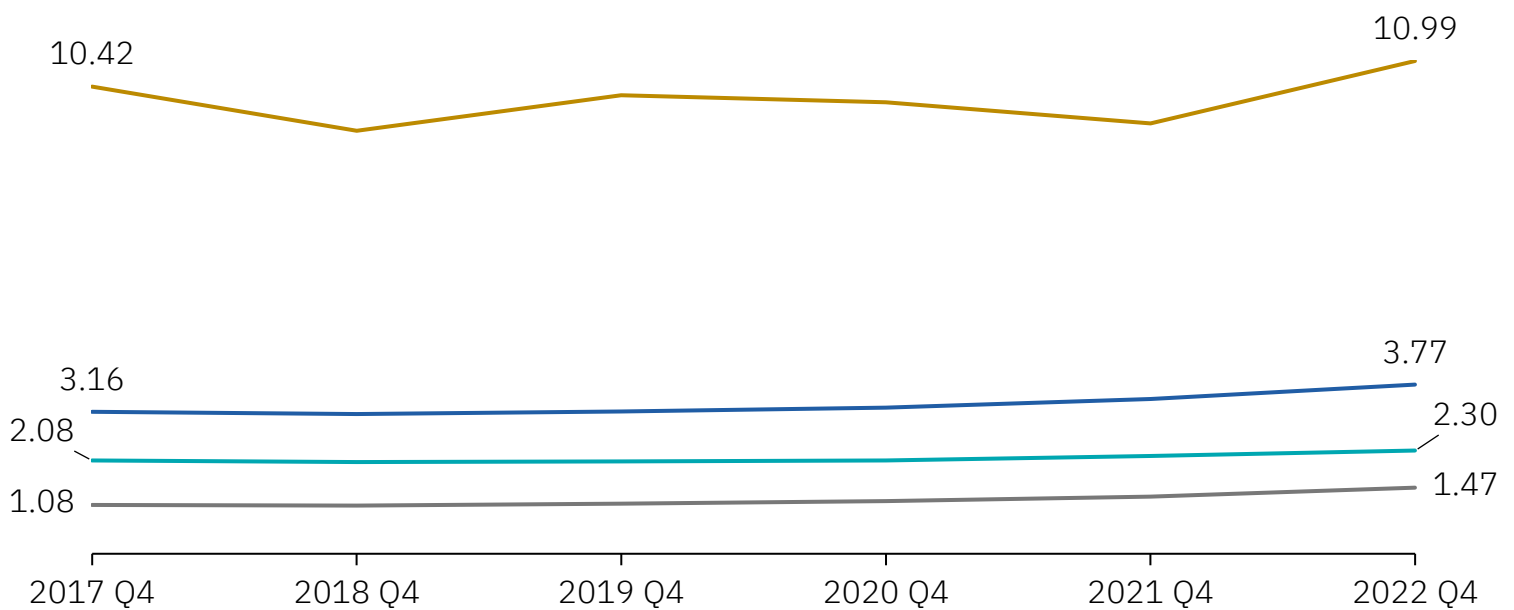


Source: General Authority for Statistics

Figure 1: KSA current labour market picture

Where are we now – a snapshot of the labor market

A snapshot of the KSA labor market in numbers show that the Saudi population is entering the labor market at high rates, yet Saudi workers are at around one (33.8 %) of the employed total (2022/Q4)*. Expat workers dominate the private sector and Saudi workers the public sector. However, as we shall see, both the number and share of Saudi workers in the private sector is increasing steadily, in line with Vision 2030 and Saudization policy aims of growing the contribution of the private sector to the economy.

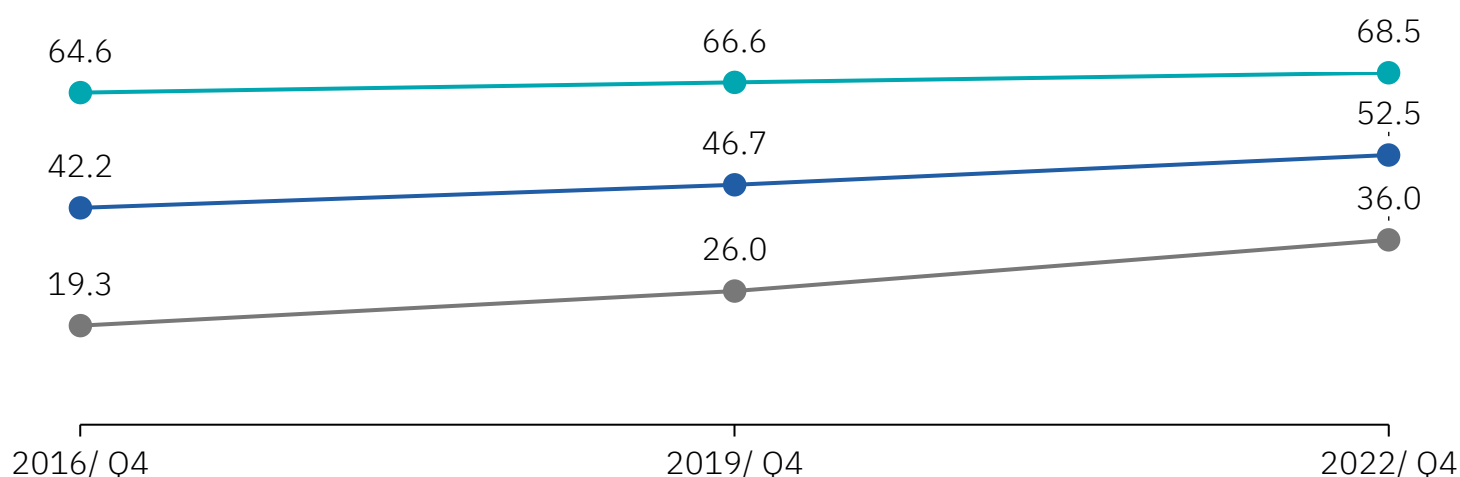


* Percentage of Saudis from total employment is calculated excluding domestic workers out of the total employed

Source: General Authority for Statistics — Non-Saudi Total — Saudi Total — Saudi Males — Saudi Females

Figure 2: Total employed, Saudis (males, females, total) and Non-Saudis (in Mn, 2017-2022)

Women have been entering in the labor market at an impressive and unprecedented rate in recent years. Women now make up almost 40% of Saudi workers. The labor force participation rate for both Saudi women and men have increased over the years, and the rate currently stands at 36% for women, up from only 19.3% in 2016, compared with 68.5 % for men, which is up from 64.6 % in the same time interval.



Source: General Authority for Statistics

● Males ● Females ● Saudi total

Figure 3: Labor force participation rate, Saudi males, females and total (2016 – 2022, in %)

When we look at the unemployment rate, it shows that both youth and women are an underutilized resource in the economic transformation. The overall unemployment rate for Saudi workers stands at 8 % (2022/Q4). For youth (15-24) the total unemployment rate is rather high at 16.8 % (2022/Q4). The unemployment rate for Saudi men is at 4.2 % (2022/Q4), whereas the unemployment rate for Saudi women is at a relatively high level, at 15.4 % (2022/Q4), however the rate of unemployed women has decreased drastically in the last years. The unemployment rate for young women is at a high 26 % and for young men the rate is half of that of women, but still at a relatively high level, at 12.5 % (2022/Q4).

What are active labor market policies?

The objective of active labor market policies (ALMPs) is to connect people with jobs. It does this through publicly funded policies designed to give more people access to the labor force (OECD and ILO).

What are skills mismatches?

Skills mismatch is a discrepancy between the skills that are sought by employers and the skills that are possessed by individuals (ILO).

What is “jobs polarization”?

Jobs polarization describes a phenomenon where jobs requiring a moderate level of skills disappear relative to low-skilled jobs, and those at the top, requiring greater skill levels.

What are “reservation wages”?

The reservation wage is defined as the smallest wage at which a worker is willing to accept a job.

Box 2: Labor market concepts

These rates also declined significantly in recent years, but there is still room to include more young people and women especially in labor market participation to capitalize on the demographic dividend in the economic transformation of the economy.

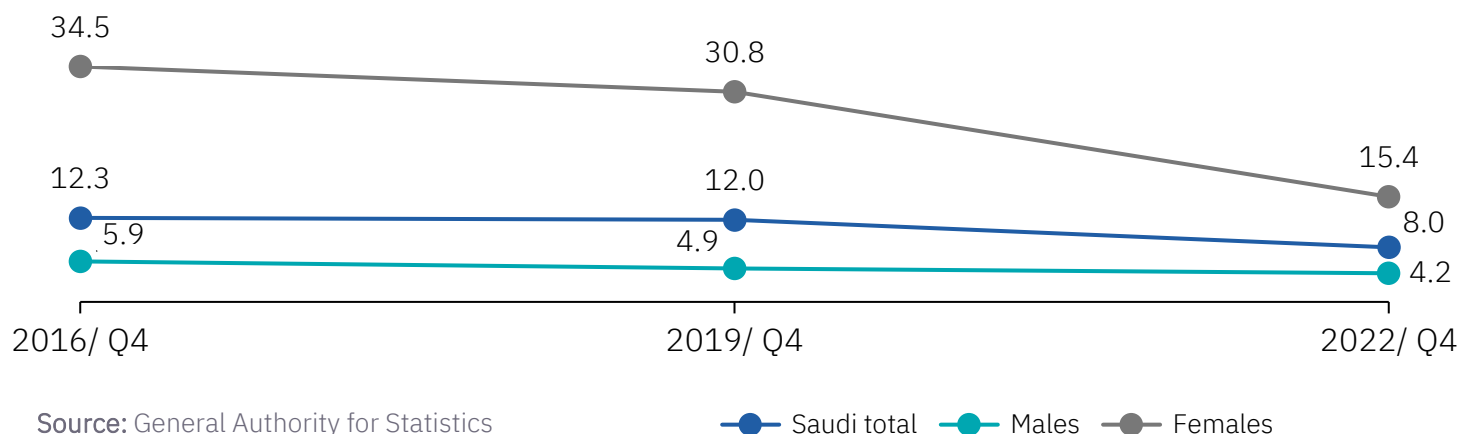


Figure 4: Unemployment rate, Saudi males, females, and total (2016 – 2022, in %)

Saudization policies, women’s entry into the labor market and the demographic dividend to residing in Saudi youth are therefore key areas to capitalize on in the economic transformation. Education and skills policies, active labor market policies, wages and working conditions policies need to facilitate the entry of a larger share of the Saudi population. Decent working conditions, work-life balance, flexible working conditions, decent wages and social welfare systems including childcare facilities play a role in the utilization of larger shares of the labor force.

How is the labor force participation rate defined?

The labour force participation rate is the number of persons in the labour force as a percentage of the working-age population. The labour force is the sum of the number of persons employed and the number of persons unemployed.

How is the employment rate defined?

The employment rate is the proportion of a country’s working-age population that is employed. Employment comprises all persons of working age who during a specified time period are engaged in paid employment or are self-employed.

How is the unemployment rate calculated?

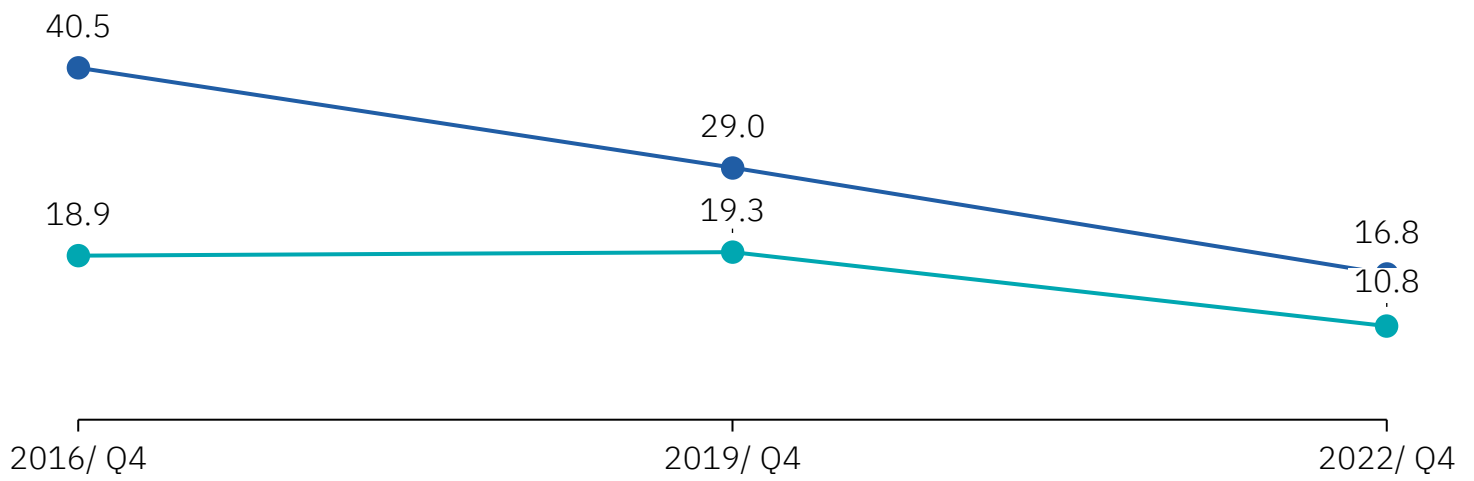
The unemployment rate is calculated by expressing the number of unemployed persons as a percentage of the total number of persons in the labour force. The labour force is the sum of the number of persons employed and the number of persons unemployed.

What is the difference between the labor force and the workforce?

The labor force is comprised of the employed plus the unemployed, whereas the workforce consists of persons who are engaged in some kind of work.

Source: ILO

Box 3: Key labor market statistics concepts and definitions or market concepts



Source: General Authority for Statistics

● 15-24 ● 25-34

Figure 5: Unemployment rate, Saudi younger age groups (2016 – 2022, in %)

Where have we been – trends across time

Historical data are vital to determine the trends of the future. Labor market trends do not necessarily develop in a linear or predictable fashion. Globally, occupational structures are characterized by slow changes and wages are not necessarily purely influenced by the supply and demand of labor. In this section, historical analyses will track the gradual shifts in the labor market. Tracking the labor market trends is important as it lies at the foundation of future policies.

Age: Younger workers are coming

Key Findings:

The working population of Saudi Arabia is increasingly younger than before.

The first historical analysis with available data shows that the age distribution of workers in the KSA labor market has been changing over time. The share of younger workers is increasing while the older age groups constitute a smaller share of the labor market at the end of 2022 than in 2016.

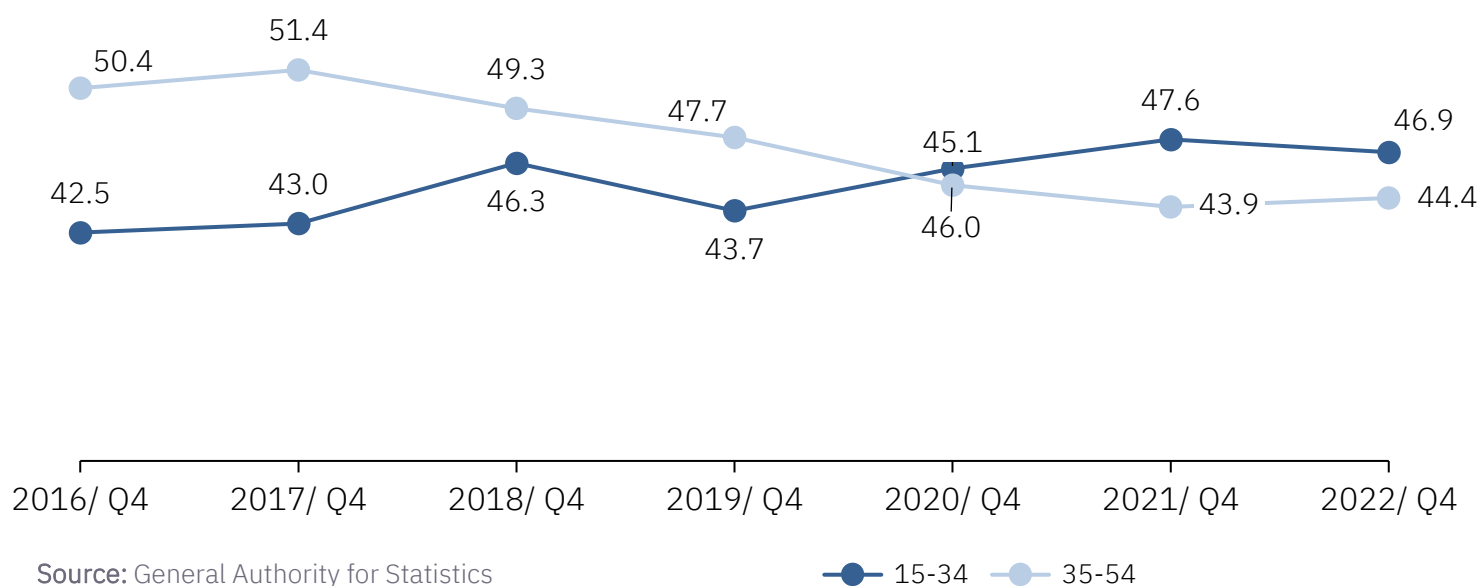


Figure 6: Age distribution of employed workforce, Saudi men (2016 – 2022, in %)

The working population in Saudi Arabia is becoming younger, as the share of the younger age groups (15-34) steadily increased from 42.5 % in 2016 to 47 % in 2022 for Saudi men, while the shares of the core age group (35-54) declined from 50.4 % to 44.4 % share of employed men.

We see a similar pattern for the share of employed Saudi women as for Saudi men. The younger age group (15-34) as not yet overtaken the core age group (35-54), as in the case of male workers. The younger age group is however almost equal in share at 46 % of the employed versus a 48 % share for the core age group.

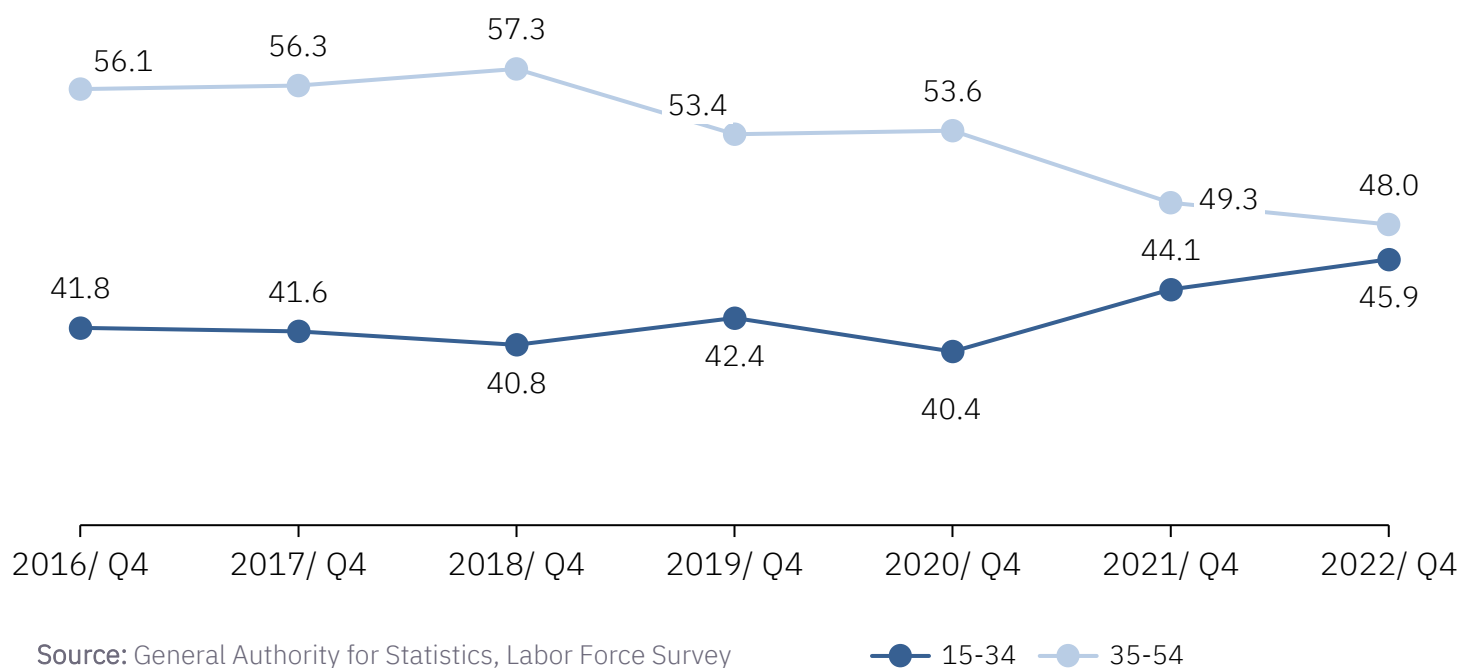


Figure 7: Age distribution of employed workforce, Saudi women (2016 – 2022, in %)

The non-Saudi employed population is seeing the opposite trend. Among expat workers the younger age group as share of non-Saudi workers is shrinking slightly, and the share of older workers is thereby growing. The younger age groups (15-34) of non-Saudi men decreased from 27.5 % in in 2016 to 22.6 in 2022, whereas the core age groups (35-54) increased its share slightly from 63.1 % to 65.4 % during the same time. For non-Saudi women there was a slight decrease in both the youngest age group and the core working population.

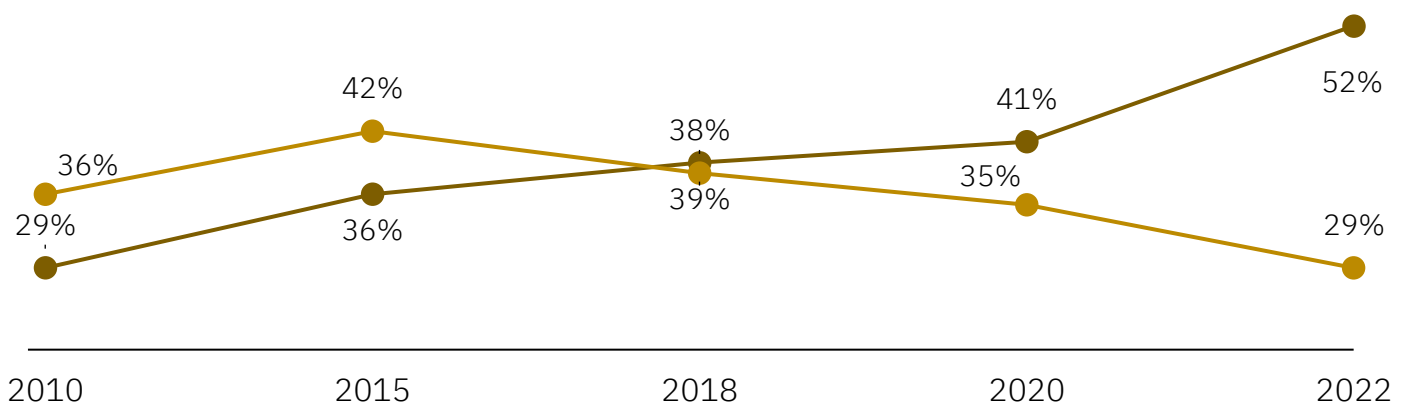
Key implications:

- Active labor market policies are key to absorbing the increase in young workers into the Saudi labor market.
- Young people may have different expectations to wages, work conditions and job flexibility than older workers, and the labor market may have to adapt to new demands to be attractive to younger workers.
- Education and skills of younger workers may not match the requirements of the labor market, and opportunities for upskilling and reskilling both in formal educational settings and through on- the-job training are important features of labor market policy.
- Saudization policies coupled with expat quotas and fees for residence permits (iqama) contribute to decreasing the share of younger non-Saudi workers.

Occupations: More managers, fewer clerks

Key Findings:

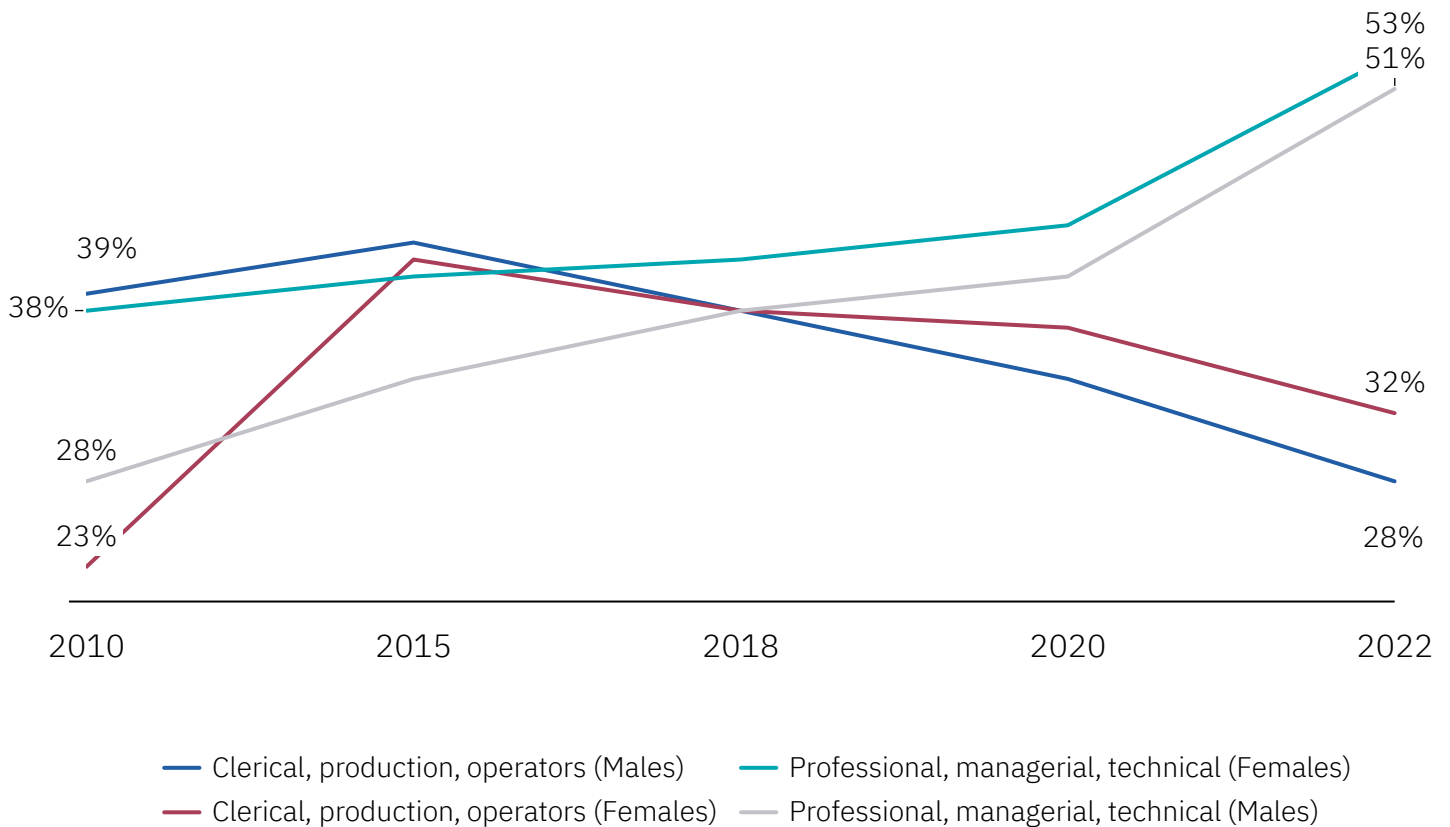
- Professional, managerial and technical jobs are increasing at the expense of clerical, production and operations jobs.
- Women and men are entering high skilled professions in equal shares, wherein around half of both women and men Saudi workers are in high-skilled professions.



Source: General Organization for Social Insurance —●— Professionals, managerial, technical —●— Clerical, production, operators

Figure 8: Share of select occupational groups for Saudi employees (2016 – 2022, in %)

Saudi women and men are increasingly employed in higher-skilled occupations in the professional managerial and technical fields, replacing more lower-skilled occupations categories, in comparison with the professional and managerial occupations. In fact, half of both women and men in employment are in higher-skilled occupations.



Source: General Organization for Social Insurance Microdata

Figure 9: Share of select occupational groups, Saudi males and females (2010 – 2022, in %)

The increase in the higher-skilled occupations has gone up from 38 % share of women in 2010 to 53 % of women, whereas the share of men has gone up from 28 % in 2010 to 51 % in 2022. For Saudi women the decrease in lower-skilled professions started in 2015 and is currently at 32 %. Whereas the share of men in lower-skilled professions is slightly lower than for women, at 28 %.

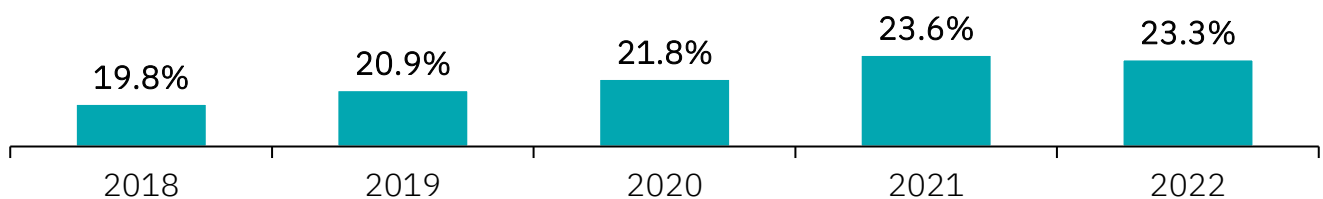
Key implications:

- The occupational structure is changing towards more high-skilled occupations, but not at a fast rate. This phenomenon of relatively slow changing occupational structures is a common feature around the globe. The result is that it can take time for the labor market to absorb young skilled workers. This underscores the importance of implementing active labor market policies, closely monitoring the labor force and designing training and upskilling initiatives.
- Technological advancements may lead to some lower-skilled jobs being at risk of automation.
- Pay attention to the global trend of jobs polarization and assess to what extent it applies to the KSA labor market. If there is an increase in high-skilled jobs at the same time as middle-skilled jobs are automated and disappearing, it could lead to higher inequality.
- Continue the trend of equality of women and men entering high-skilled jobs in equal shares in the professional categories so that all of society take part in the economic and technical revolution in the KSA labor market.

Sectors: Localization is surging

Key Findings:

- Both the actual number and share of Saudis employed in the private sector has increased between 2018 and 2022.
- Although the share of Saudi workers in the public sector* has decreased between 2018 and 2022, the actual number of Saudis employed in government jobs has gone up.
- The number of Saudi workers has increased at a higher rate between 2018 and 2022, compared to non-Saudi workers.
- Saudi women have made a switch from public to private sector.

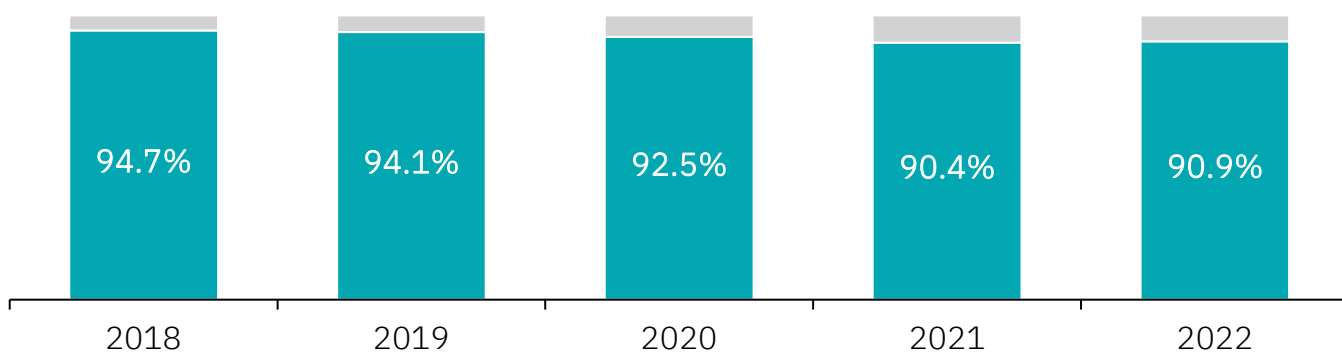


Source: General Organization for Social Insurance

Figure 10: Private sector localization rate (2018 – 2022, in %)

* The public (government) sector includes those subject to civil service regulations and government employees subject to insurance regulations (GOSI)

The share of private sector Saudi workers has increased over time, with a small drop between 2021 and 2022. In real numbers the Saudi working population in the private sector has increased by 490,000 workers from 2018 to 2022, from approximately 1.7 million workers to 2.2 million workers, according to General Organization for Social Insurance (GOSI) numbers.¹



Source: General Authority for Statistics , Labor Force Survey

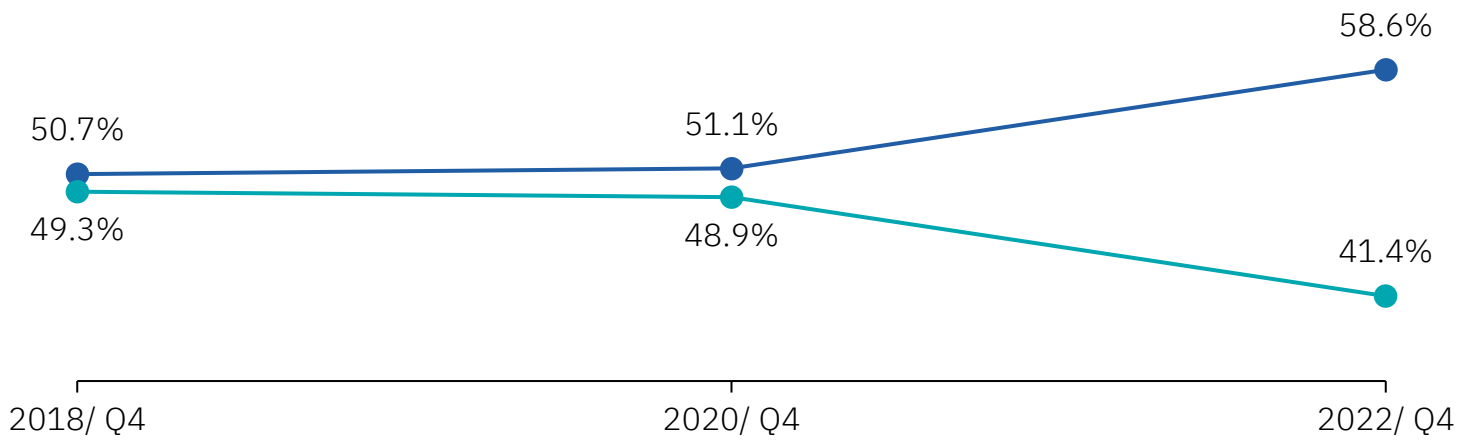
Figure 11: Public sector, share of Saudis and non-Saudis (2016 – 2022, in %)

In the governmental sector² there has been a decline in the share of Saudi workers. At the same time the actual number of Saudi workers employed in the public sector has gone up. In 2018 there were 1.4 million Saudis employed compared with almost 1.6 million employed in 2022. This implies that there has been an increase in government jobs overall.

Saudi women have in this context made a switch from having equal shares of employment in the public and private sectors to the largest share of women now working in the private sector. The share of Saudi women in the private sector out of total Saudi female employees has gone up from 50.7 % in 2018 to 58.6 % in 2022.

¹ The labor force survey (LFS) is another source of data for sectoral distribution. It is common that register-based data and survey data differ, but both sources are equally valuable as long as the differences are explained. For example, people who register as unemployed may be lower than people who respond that they are unemployed in a labor force survey. In our case, the LFS data differs from the GOSI data, but the LFS data confirms the same trend as the GOSI data of increasing shares of Saudi workers in the private sector. The reason for the difference is due to two reasons i) self-employment is captured by the LFS but not by GOSI, and ii) GOSI data covers only those enrolled in the social security system. It is a current policy effort to enrol more workers in the social security system.

² The public (government) sector includes those subject to civil service regulations and government employees subject to insurance regulations (GOSI)

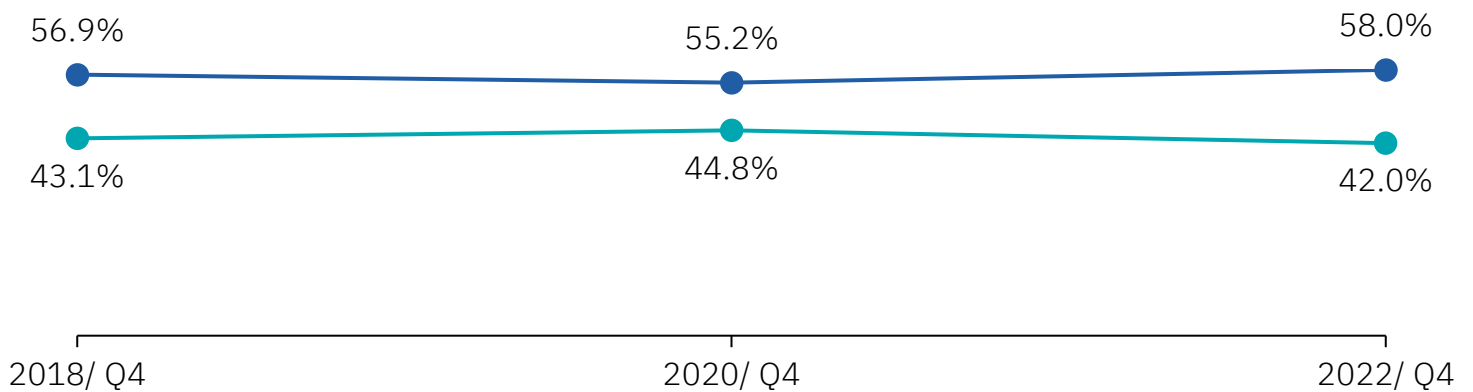


Source: General Authority for Statistics , Labor Force Survey

● Private sector ● Public sector

Figure 12: Sector distribution, Saudi females (2018 – 2022, in %)

For Saudi males, the trend is similar as for Saudi women, however the trend line is less steep. The share of men working in the public sector has gone down from 43% in 2018 to 42% in 2022. Correspondingly the share of men working in the private sector has gone up from 57% in 2016 to 58% in 2022.



Source: General Authority for Statistics , Labor Force Survey

● Private sector ● Public sector

Figure 13: Sector distribution, Saudi males (2018 – 2022, in %)

Key implications:

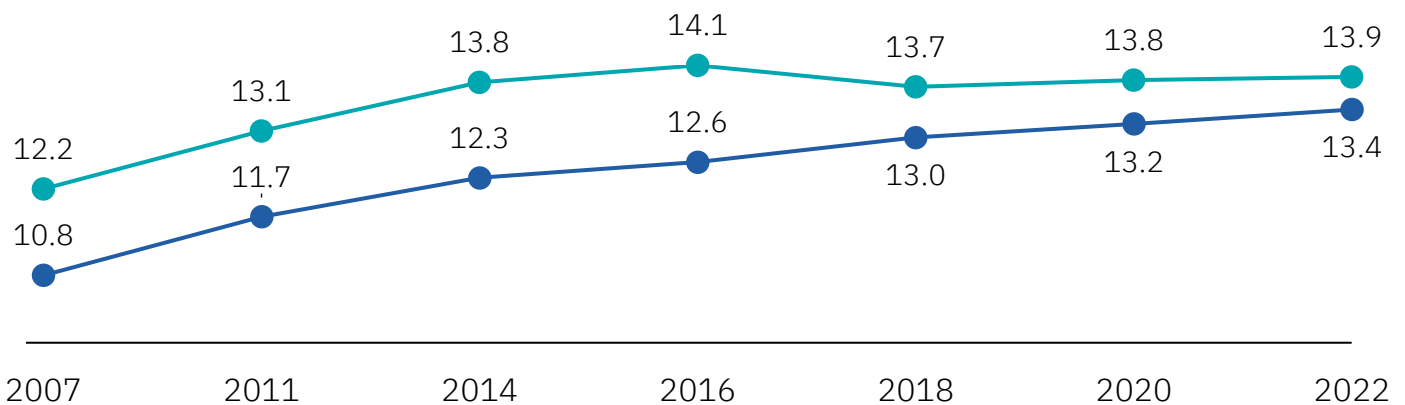
- The positive trend of increasing numbers of Saudi workers entering the labor market needs to be maintained.
- Saudi women appear to be entering the private sector at a very high rate which places demands on the private sector to adapt to women workers to retain them and attract more.

Education: Welcomed by the labor market

Key Findings:

- The unemployed have more education than the labor force, but the gap is closing over time.
- Years of education obtained has increased substantially in both the labor force and for the unemployed group between 2007 and 2022.
- The share of unemployed women with a college education is larger than the share of unemployed men with a college education.

When we look at average years of obtained education, we find that the unemployed have more years of education than the labor force. The gap began to close in 2018, and the years differing between the labor force and the unemployed is only 0.5 years education in 2022. This is a positive trend as it indicates that the labor market is increasingly able to absorb educated young people. This trend can be attributed to KSA's active labor market policies (ALMPs). ALMPs have been implemented in line with vision 2030 to offer highly educated young people good labor market opportunities.



Source: General Authority for Statistics , Labor Force Survey, GOSI, and NLO calculations

● Labor force ● Unemployed

Figure 14: Average years of education, labor force vs. unemployed (2007 – 2022)

Based on calculations from the NLO, the average years of education of the labor force increased from 10.84 in 2007 to 13.39 years in 2022. During the same time interval, the average years of education of the unemployed group increased from 12.17 to 13.89 years in 2022. However, between 2016 and 2022 the number of years of education decreased in the unemployed group, from 14.07 years to 13.89. This suggests that the likelihood of being employed increases with educational attainment in the Saudi labor market.

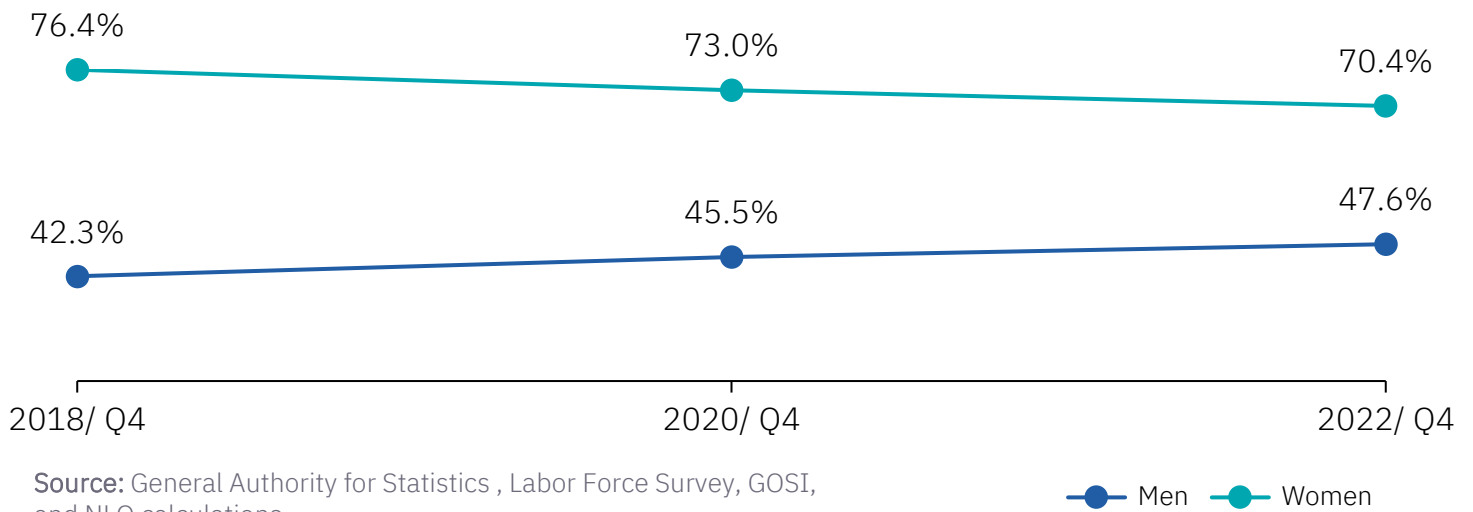


Figure 15: Share of unemployed men and women with above high school education (2018 – 2022, in %)

For Saudi men there is an increase in people with education above high school level among the unemployed group, whereas the share of unemployed people with high school education or below either decreased or remained stable. It will be important to pay attention to this trend, and tailor active labor market policies to ensure that the group of unemployed men with post-secondary education access the labor market. The share of unemployed Saudi women with education above high school level has been decreasing, but this group is much larger than the comparative group of Saudi men. This indicates that there is a demographic dividend in employing educated women. This finding is also in line with the higher unemployment rate for women. These trends are influenced by the availability of jobs, skills mismatches, employment policies and wage levels. In addition, the level of mobility within the country and job-searching behavior can influence unemployment levels.

Key implications:

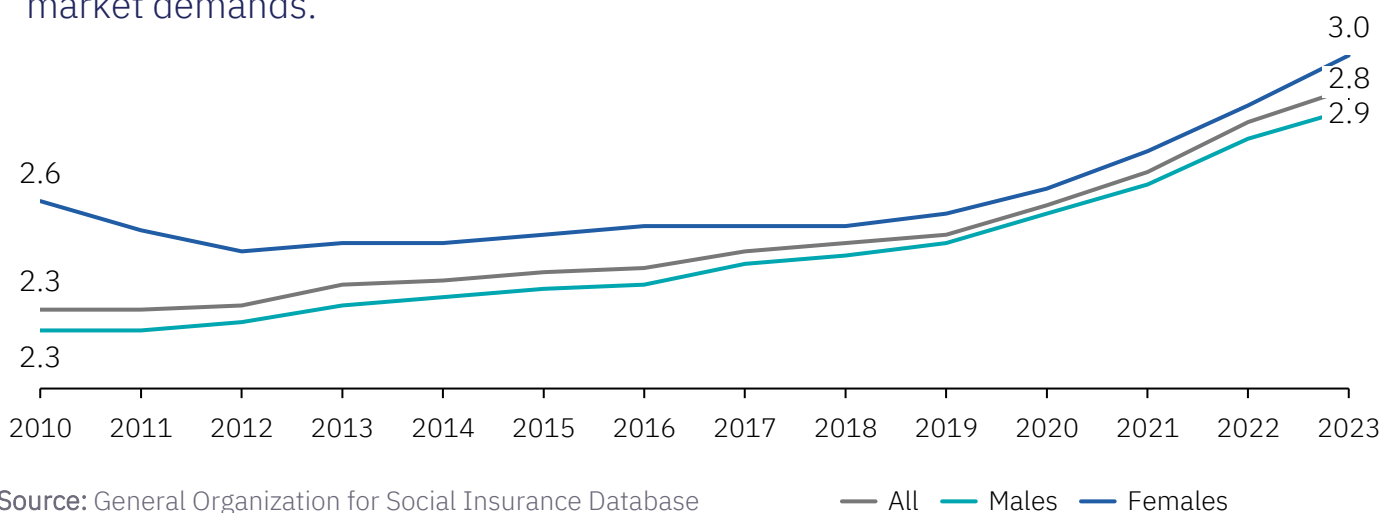
- Active labor market policies will continue to be important in the years to come to facilitate access of unemployed people into the labor market, including giving attention to unemployed men with post-secondary education.
- Young people and women are groups that may need targeted ALMPs as these groups have higher levels of unemployment.

Skills: Upskilling is the name of the game

Key Findings:

- Saudi men and women have had a definitive rise from low skilled to high skilled professions in the last decade.
- The low skilled jobs are in decline for Saudi workers, but it does not mean that these jobs are less important.

Skills are not static, but dynamic components of the labor market. They respond to the changing landscape of production technologies and market demands. Individuals and societies that recognize and adapt to these changes are better positioned to thrive in a rapidly evolving job market. In KSA we see that the level of skilled workers has been increasing over the years to meet the changing labor market demands.



Source: General Organization for Social Insurance Database

— All — Males — Females

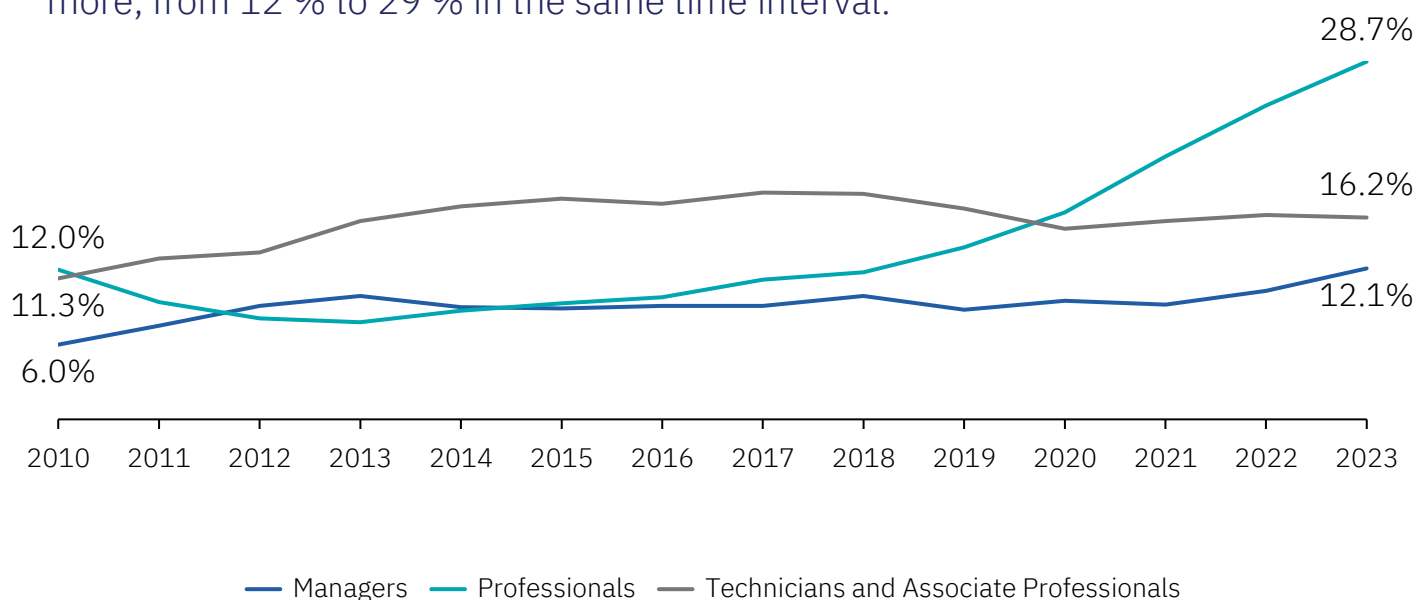
Figure 16: Skills index, Saudi males, females, and total (2010 – 2022)

Saudi workers have made a significant switch from low-skilled jobs to higher-skilled jobs, and the Saudi population is approaching skill level three. In international classifications, called ISCO, this is the equivalent to skill levels required for the job categories technicians and associate professionals, whereas the 2010-level, closer to skill level two in the ISCO classifications, is equivalent to clerical support work, machine operators, service and sales.² The make-up of the Saudi labor force has in other words changed substantially in relation to skills and which jobs Saudi women and men occupy.³

² ILO. *International Standard Classifications of Occupations (ISCO)*.

³ The skills index is inspired by the work of Acemoglu and Autor (2011). The basic method is the same, applied in a simpler version. In this version, by utilizing the International Standard Classifications (ISCO), occupations categories from the GOSI administrative dataset are categorized in accordance with skill level. In ISCO professionals are categorized as skill level 4, technicians and associate professionals at 3, and clerical workers at 2, in addition to several other categories of occupations. The average level of skill for the Saudi workforce is subsequently calculated per year, from 2010 until 2023. On this basis the picture in Figure 16 is presented. Source: Acemoglu, Daron, and David Autor, 2011. "Skills, tasks and technologies: Implications for employment and earnings." *Handbook of labor economics*. Vol. 4. Elsevier, 2011. 1043-1171

This increase in skill level is in line with how the Saudi labor force have transitioned to higher-skilled occupations. Saudi workers are represented increasingly in managerial, professional occupations by share of workers by occupations. The share of managers has gone up from 6 % managers in 2010 to almost 12 % in 2023, whereas the share of professionals has increased even more, from 12 % to 29 % in the same time interval.

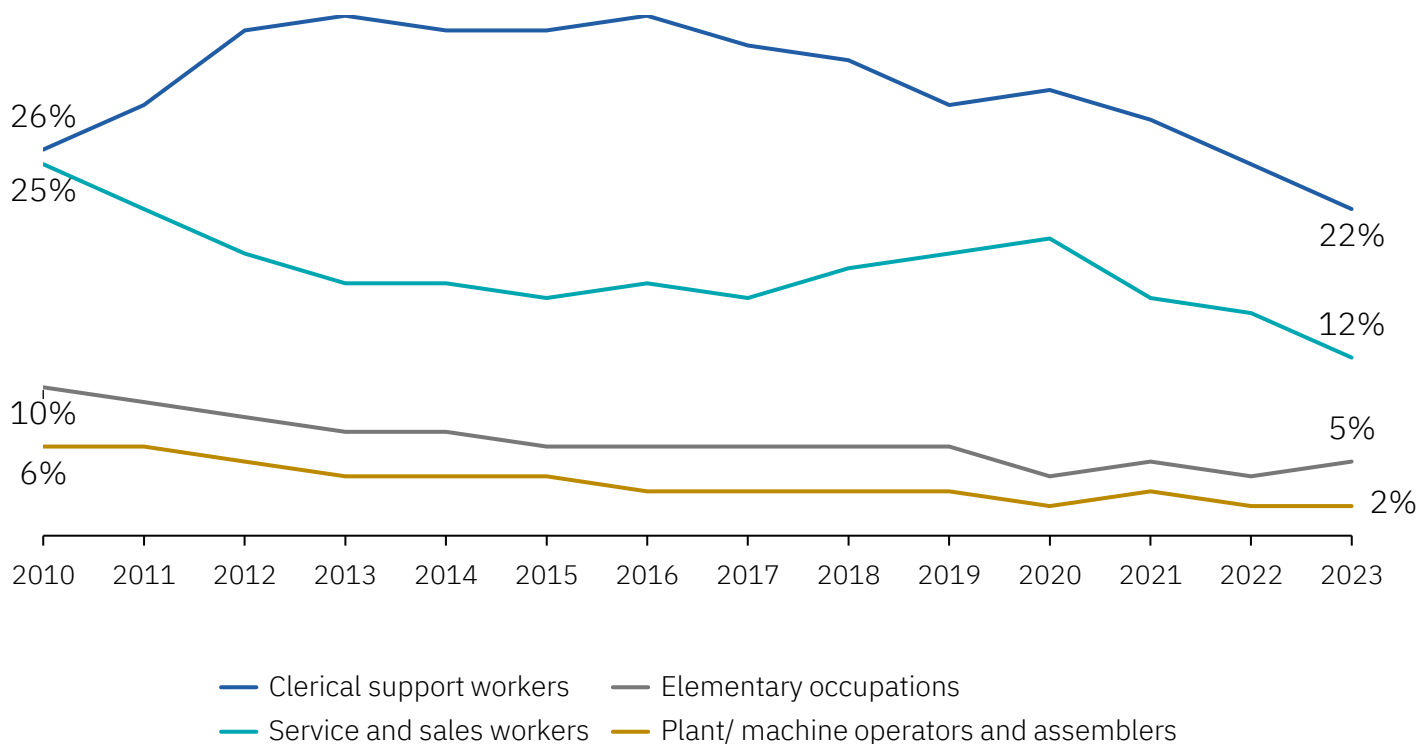


Source: General Organization for Social Insurance Database

Figure 17: Development of high-skilled job categories and share of Saudis in each category (2010 – 2023, in %)

As the share of Saudi workers increase in high skilled professions, the share decreases in lower skilled professions. Occupations such as clerical support workers, service and sales workers, plant and machine operators and elementary occupations are not declining as steeply as the professional and managerial positions are increasing, however. The share of Saudi workers in clerical positions have gone down from 26 % to 22 % share of the Saudi labor force between 2010 and 2023. Service and sales is a category with a steeper decline, going down from 25 % to 12 % between 2010 and 2023.

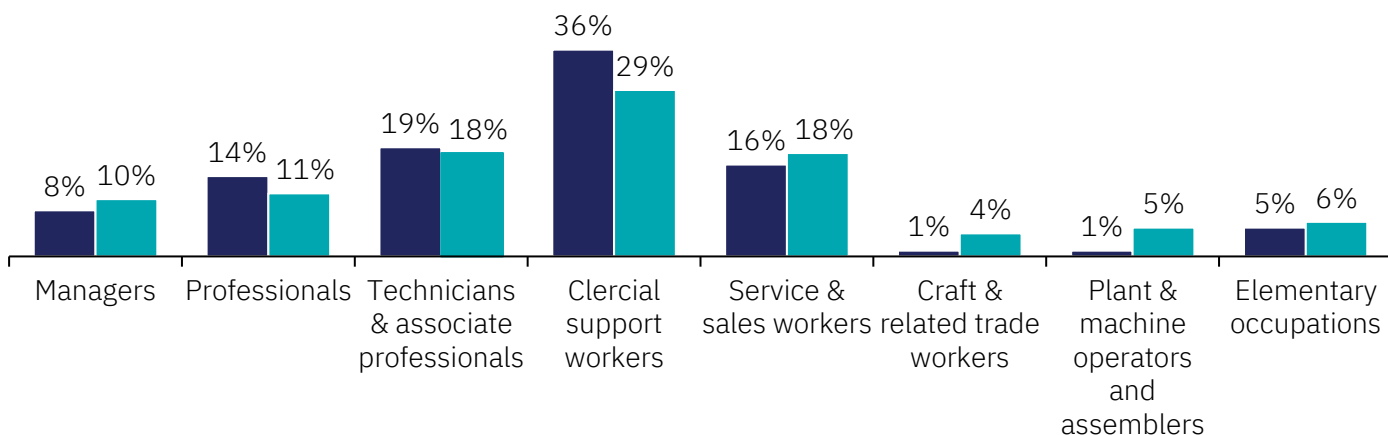
Importantly, these occupations are not necessarily becoming less important in the labor market. These trends need to be seen in line with how almost three quarters of the labor force in KSA are expat workers.



Source: General Organization for Social Insurance Database

Figure 18: Development of low-skilled job categories and share of Saudis in each category (2010 – 2023, in %)

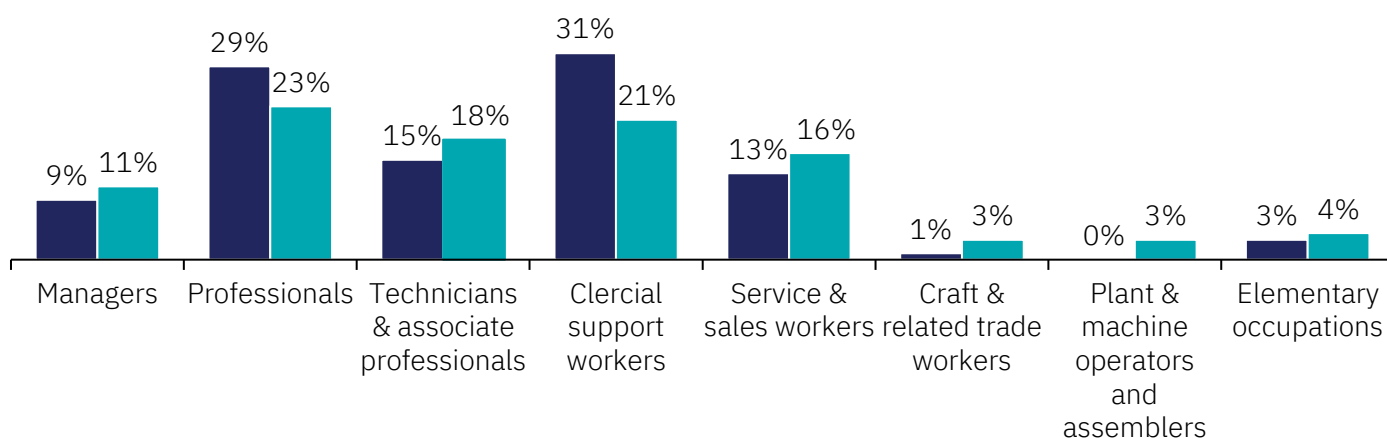
In an overview of the share of Saudi women and share of Saudi men in various occupational categories, we can trace the impact of recent labor market policies that targets Saudi nationals. Encouraging Saudi women to enter the labor market has been a focus in recent years, and these policies may reflect in which occupations Saudi women are concentrated.



Source: General Organization for Social Insurance Database

Figure 19: Share of Saudi females and males in various occupations (2018, in %)

We observe the same switching pattern from lower to higher-skilled occupations for both men and women between 2018 and 2022, but we also observe that some major differences emerge between men and women.



Source: General Organization for Social Insurance Database ■ Females 2022 ■ Males 2022

Figure 20: Share of Saudi females and males in various occupations (2022, in %)

Women have mostly switched to professional occupations, where the share of women has more than doubled, from 14 % in 2018 to 29 % in 2022. In 2022 the share of the women in the professional category is in fact just below the share of women in clerical positions, which is at 31 %. This means that 6 out of 10 employed Saudi women worked in these professional or clerical occupational categories in 2022, a large share of the female workforce. Men have also increased their share significantly in the professional occupational category, going up from 11 % to 29 % between 2018 to 2022. The gap between men and women remains constant in the managerial category between 2018 and 2022, at 2 percentage points difference in favor of men.

Key implications:

- As more Saudi workers enter the labor market in, or switch to, professional, managerial and technical professions, the importance of filling lower-skilled positions must retain focus.
- Formal education must be complemented with reskilling, upskilling and on-the-job training and learning in the context of the workplace.
- Wages in both high-skilled and low-skilled jobs should be at a level where the wages contribute to both attracting and retaining workers.

Where do we go from here – the future of work

From the previous sections we know that the labor force participation has been increasing, and Saudi workers are entering high-skilled professions at a high rate. The entry of educated young people and women into the Saudi workforce has significantly changed the Saudi labor market over the course of the last decade. Two issues can be derived from this for the future of work, i) the labor market may struggle to absorb the influx of workers, and ii) there may be skills mismatches wherein the formal education the workers have received no longer fit the job description. Lifelong learning, upskilling and reskilling will be necessary, as well as an ability to flexibly adapt to technological advances during a career.

Upskilling and reskilling are essential to meet the current and future effects of digitalization and artificial intelligence (AI) as well, and AI will be fundamental to determining the future of work. In the Saudi context it is also crucial to keep in mind the economic transformation policies from in Vision 2030 with significant efforts to diversify the economy, as AI and diversification policies will influence the labor market in interlinked ways.

Artificial intelligence affects all sectors and occupations

Automation relating to digitalization and artificial intelligence is set to change the nature of work. The OECD points to how artificial intelligence (AI) will affect the labor market differently than previous technological developments. For one, AI expands the range of tasks that can be automated, beyond non-cognitive tasks. Secondly, AI can be applied all sectors and occupations to a larger degree than previous technological advancements, and lastly, the speed of development of AI technology is incredibly rapid.⁴

International literature posits that AI will be one of the most important drivers for economic growth in the coming years. In countries where the population is highly educated and digitally mature, the possibility for early adoption and use will constitute a significant competitive advantage.⁵

⁴ OECD (2023). [OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market](#). OECD Publishing, Paris.

⁵ McKinsey (2023). [The economic potential of generative AI: The next](#)

AI has had relatively limited reach in traditional workplaces until now, as economies stand at the brink of an AI revolution but have far from experienced the full effects of AI on the labor market. AI may have very different effects on low and high-skilled occupations, wherein high-skilled workers may experience greater job satisfaction by being able to focus on the aspects they find most interesting about their jobs, whereas some categories of medium and lower-skilled occupations are at risk of disappearing due to automation.

An ILO study found that AI is more likely to change and expand on existing jobs, rather than taking over job roles entirely. In this context the OECD theorizes that AI may even contribute to creating more jobs for higher-skilled workers (OECD 2023).⁶ In other words, AI may be more complementary to the labor market, if absorbed well, than pose a threat of automation. In some positions, such as clerical work, the ILO finds that more than half of tasks are exposed to be taken over by AI, at medium risk level. Whereas for managers, professionals and technicians a quarter of tasks were found to be at medium risk level of automation (ILO, 2023).⁷

As we have seen, Saudi workers are increasingly concentrated in high skill professions. Based on the literature, this segment of the labor force should be able to reap the benefits of AI's entry into the world of work. At the same time, a country's policies are at the foundation of the future of work, and policies will also determine how and to what extent the labor market and workers stand to benefit from technological change. Education and labor market policies will need to be able to adjust to the technological revolution.

⁶ OECD (2023). *OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market*. OECD Publishing, Paris.

⁷ ILO (2023). *Generative AI and jobs: A global analysis of potential effects on job quantity and quality*. International Labour Organization, 2023.

Policies that influence the future of work

KSA policies and programs for labor market transformation are wide-reaching:

- National Strategy for Digital Transformation.
- Financial sector development program.
- Health sector transformation program including the Seha Virtual Hospital.
- Human Capability Development Program.
- National Industrial Development and Logistics Program.
- National Transformation Program.
- Privatization program.
- Public Investment Fund Program.
- Quality of Life Program, and;
- Pilgrim Experience Program.⁸

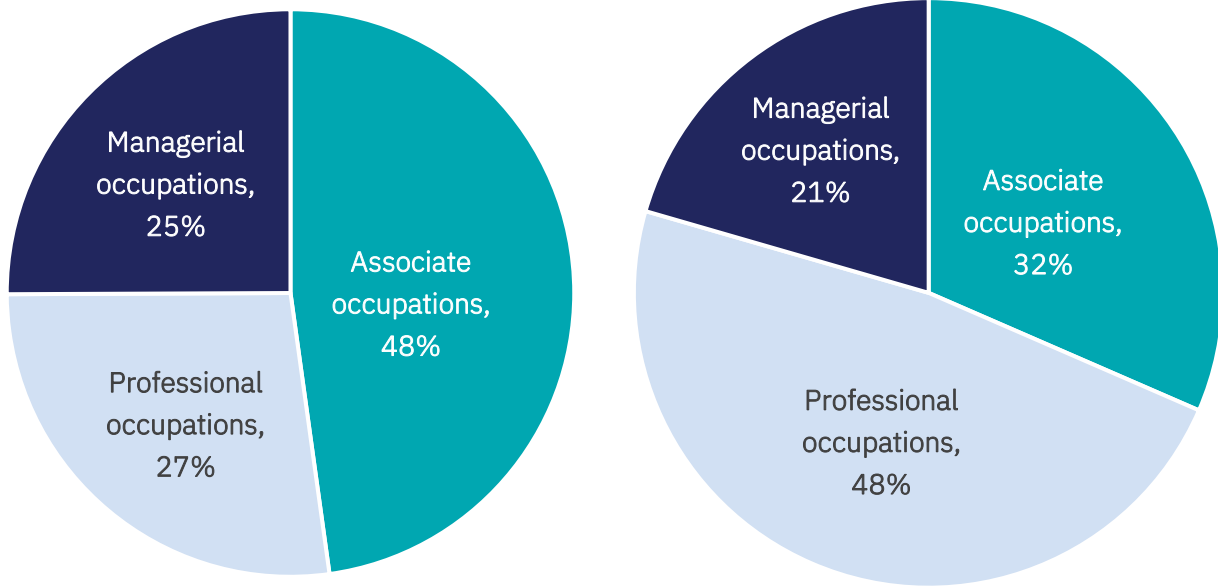
Common for all Saudi development and transformation programs is digitalization, technology and the use of AI. The technological and AI revolutions will in other words greatly affect the Saudi labor market in the years to come. For example, not only will the health care sector require health care workers but increasingly IT and AI specialists. The Seha Virtual Hospital and the Saudi Genome program are, for example, part of efforts that use AI to increase the accuracy of diagnostics which enhances doctors' ability to select priority medical interventions.⁹

Many more are working in professional occupations today

The transformation programs are evident in the rise in professional category jobs between 2016 and 2022. Professional occupations have almost doubled as a share of large occupational groups, from just over quarter of a share in 2016 to constituting almost half of occupations in 2022. Managerial positions are relatively stable in comparison, slightly decreasing in share from 25 % to 21 % between 2016 and 2022, whereas the number of associate occupations are shrinking as a share of the large occupational groups, from almost half of jobs in 2016 to one third of jobs in 2022.

⁸ Kingdom of Saudi Arabia (accessed 25.10.2023). [Vision Realization Programs](#). Government of KSA.

⁹ Ministry of Health (accessed 25.10.2023). [SEHA Virtual Hospital: Our Future is Today](#). Government of KSA.



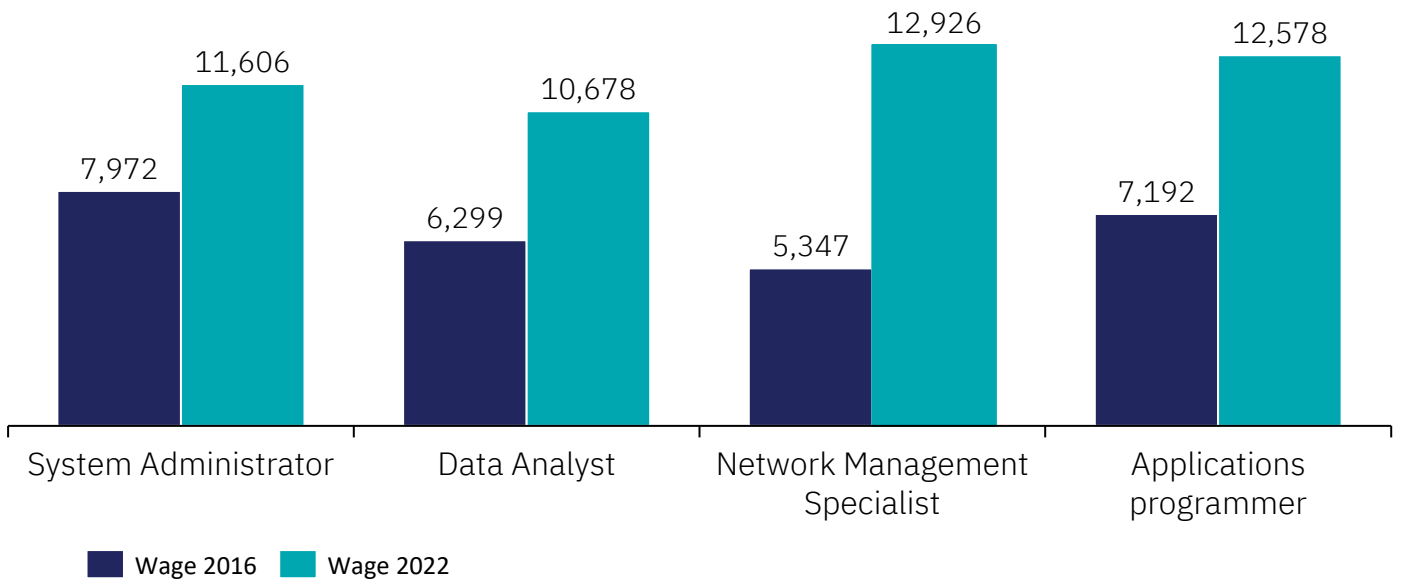
Source: : General Organization for Social Insurance Database

Figure 21: Share of jobs in large occupational groups (2016 – 2022)

In real numbers, all large occupational groups have seen an increase in the number of workers between 2016 and 2022, due to the growth in the workforce. Professional occupations have increased by almost 400 % between 2016 and 2022, whereas associate occupations have increased a meagre 82 % in comparison. Associate occupations have however begun a decrease in real numbers between 2021 and 2022. There are 34 000 fewer workers in the associate occupations category, which constitutes a minus 9 % decrease. Managerial occupations have increased by 126 % between 2016 and 2022.

Specialized IT occupations are on the rise

Based on these Saudi transformation programs we will expect to see a continued increase in the private sector participation of the labor force, continuing the trends described in the previous section. More workers will also be employed in the health care, education, tourism and hospitality sectors. In addition, the industrial infrastructure programs, including green energy, will require a supply of skilled workers in the years to come, and all related jobs will require high levels of technical competencies.



Source: : General Organization for Social Insurance Database

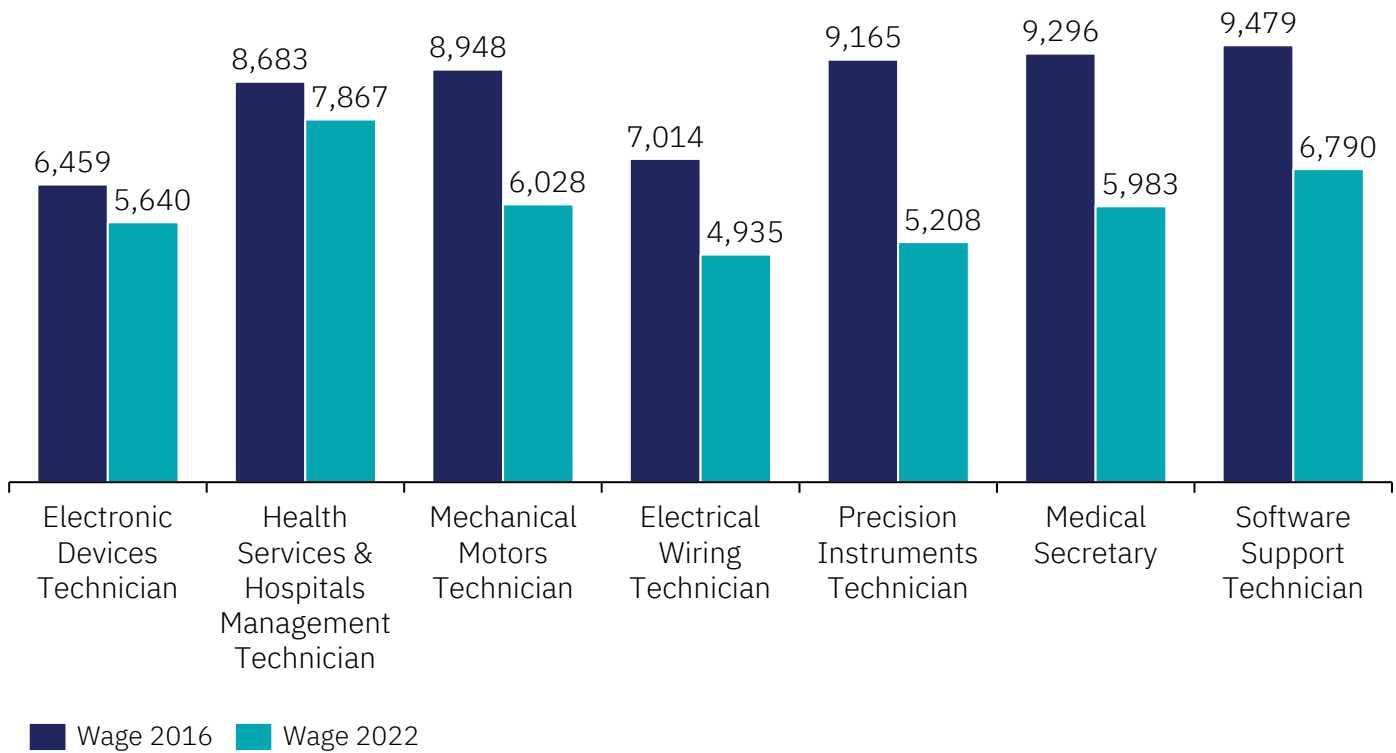
Figure 22: Select occupations among highest increase in wages (in SAR, 2016-2022)

The need for technical competencies is reflected in the data, where IT-related occupations among professionals' rank among the top ten occupations that have experienced the highest wage increase between 2016 and 2022. The increase for network management specialists amounts to 142 %, whereas the increase for application programmers amounts to 75 %. This indicates that these types of workers are in high demand.

This is in line with a study on which job postings are trending on LinkedIn for KSA. The study confirms the picture of which occupations are in high demand. In the top 15 occupations for job postings there are several IT-related occupations. Among them are back-end developer, security operations center analyst, cyber security manager, and data scientists, all relating to IT, cybersecurity threats and vulnerabilities. Another occupation category in high demand based on the KSA LinkedIn study is relating to human resources and talent acquisition. This may speak to the growing need for employers in KSA to attract talent to growing and changing sectors, for example related to IT, but also other sectors related to the KSA transformation programs. The top job posting in KSA is in fact environmental manager, reflecting that the transition to green energy and compliance with environmental regulations is a growing sector in KSA.

Technical occupations may be influenced by automation

Based on the literature on AI and automation we may expect to find that the need for some occupations may decrease. We can perhaps see traces of a decrease in demand in the technical and associate professional category of workers.



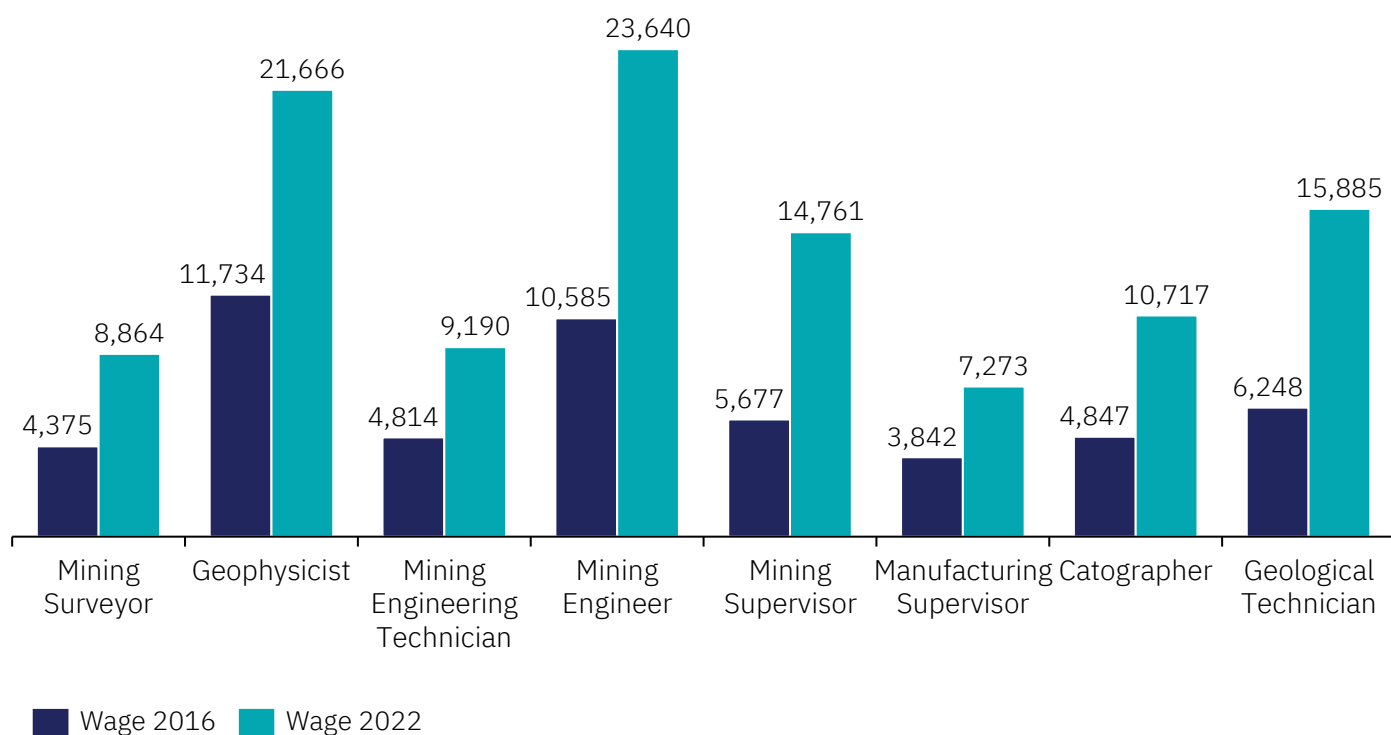
Source: : General Organization for Social Insurance Database

Figure 23: Select occupations among highest decrease in wages (in SAR, 2016-2022)

Among technicians and professionals there are indications of a trend wherein support technicians are less in demand over time. We can theorize that this is an indication of automation of more elementary technological tasks. Although this analysis is tentative, it does point to how crucial it is to offer reskilling to workers in occupations at risk of automation.

Mining and manufacturing occupations are in demand

Mining and manufacturing occupations are in demand, judging by the significant increase in wages for these occupations between 2016 and 2022. Mining engineers and geologists have for example seen a doubling in their wages in the same time period, and manufacturing supervisors' wages have also increased significantly.

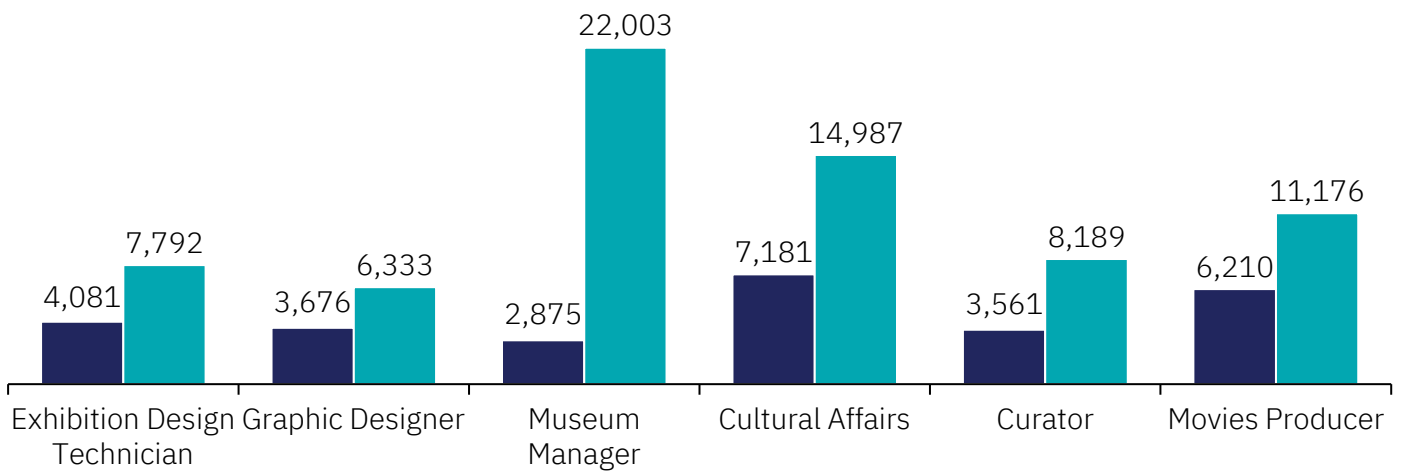


Source: : General Organization for Social Insurance Database

Figure 24: Select mining and manufacturing occupations among highest increases in wages (in SAR, 2016-2022)

The arts are surging

In line with the Quality-of-Life Program, the arts are surging in Saudi. This is reflected in a substantial increase in wages for occupations in the arts, such as museum manager, theatrical producer and exhibition design technician. Visual artists, fashion designers and conductors are also on the list of rising professions in terms of wages, and therefore also demand.



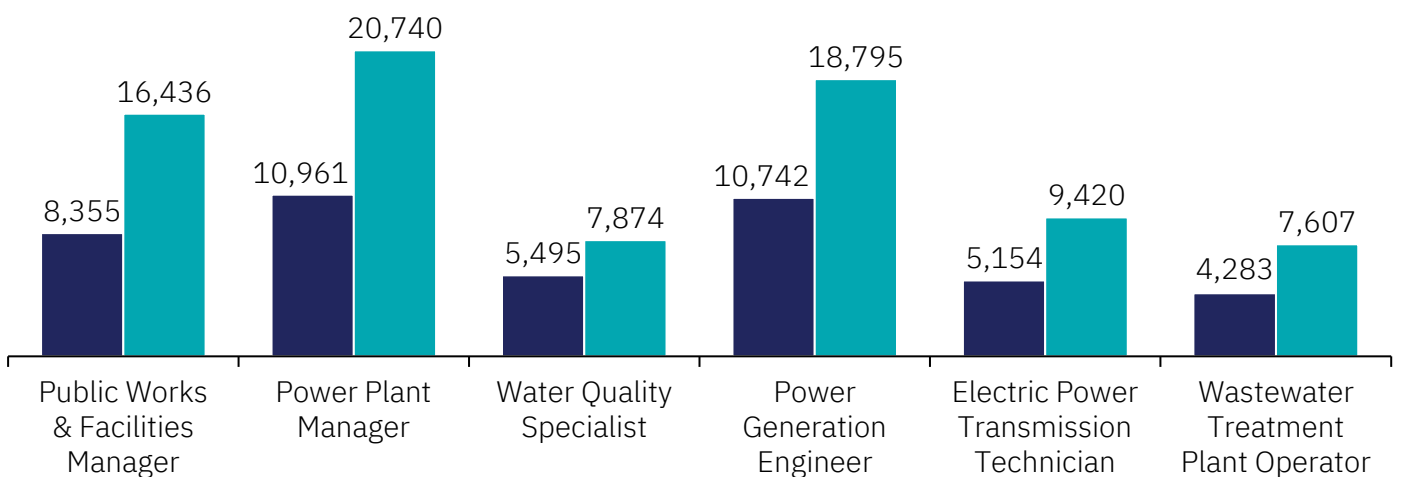
Source: : General Organization for Social Insurance Database

■ Wage 2016 ■ Wage 2022

Figure 25: Select arts occupations among highest increases in wages (in SAR, 2016-2022)

Infrastructure to the people

Occupations delivering necessary electricity and water infrastructure have seen a rise in wages between 2016 and 2022. This is in line with the transformation programs, ensuring improved services for the population, which is another important prerequisite for the population’s general welfare and their ability to take part in economic activity. Infrastructure in terms of electricity and water facilitates businesses, manufacturing, the expansion of the labor market and economic growth.



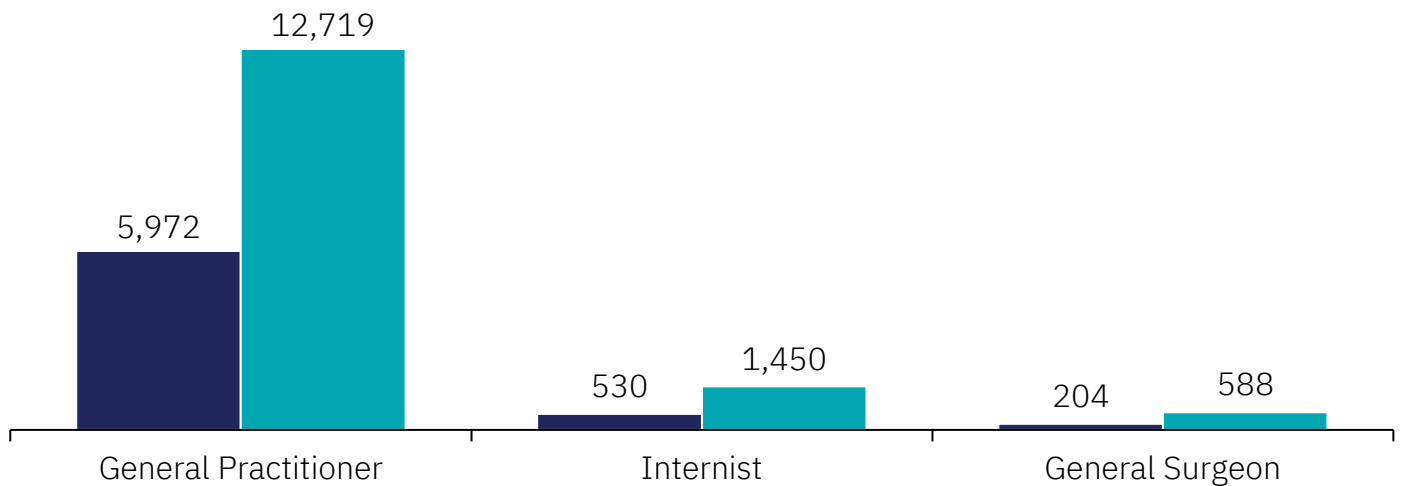
Source: : General Organization for Social Insurance Database

■ Wage 2016 ■ Wage 2022

Figure 26: Select infrastructure occupations among highest increases in wages (in SAR, 2016-2022)

Health sector growth

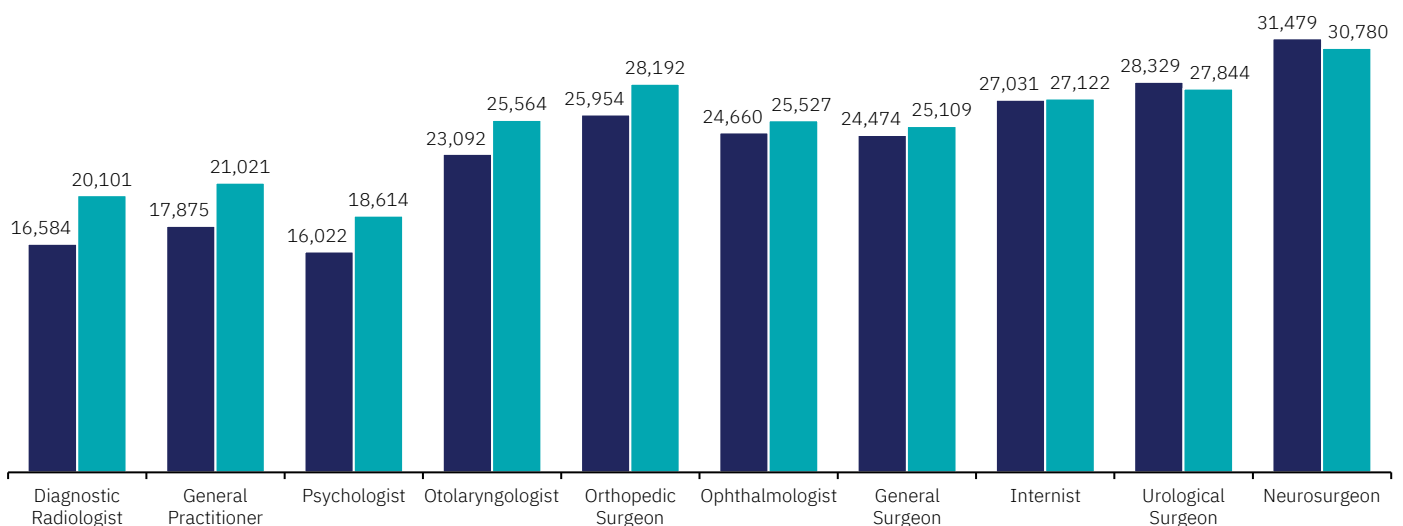
The health sector is growing in Saudi Arabia. This is reflected in the number of workers in medical professional occupations. The number of general practitioners (GPs) has more than doubled between 2016 and 2022, and salaries for GPs have increased significantly in the same period. Medical professional salaries are either increasing or remaining at high levels over time.



Source: GOSI Database

■ Number of workers 2016 ■ Number of workers 2022

Figure 27: Select health sector occupations increase in numbers, 2016-2022



Source: General Organization for Social Insurance Database

■ Wage 2016 ■ Wage 2022

Figure 28: Select medical occupations and wages (in SAR, 2016-2022)

The above analysis demonstrates how the Saudi labor market is changing in a response to Vision 2030, its transformation programs and global labor market trends. The highlighted occupations in key sectors such as IT, manufacturing, mining infrastructure, the arts and the medical field will likely continue to grow and be in demand in Saudi Arabia in the future judging by current trends. Education and labor policies need to respond to this increase in demand in key sectors, and in tandem upskill and reskill existing workers to meet future labor market demands. Policies will also need to take into account occupations at risk of automation and occupations in decline. We want to avoid high unemployment rates and discouraged workers with a lack of relevant skills and job options in this changing labor market. The actual changes in the labor market due to AI and automation are yet to be seen, however based on the overarching picture of current trends in the Saudi labor market, the labor force seems to be on a steady track towards meeting and absorbing technological change. Supporting high-skilled workers to embrace the changing labor market and mitigating the risks of workers falling behind in the changing occupations outlook, will mark the Saudi transition ahead.

Policy directions

➔ Active labor market policies key to absorbing young workers

If the education and skills of younger workers do not match the requirements of the labor market, opportunities for upskilling and reskilling both in formal educational settings and through on- the-job training will be important features of labor market policy. Young people may have different expectations to wages, working conditions and job flexibility than older workers, and the labor market may have to adapt to new demands to be attractive to younger workers in the years to come to reap the benefits of the demographic dividend the young population of Saudi Arabia represents.

➔ Address young workers' expectations to working conditions, job flexibility and wages

Young people may have different expectations to working conditions, job flexibility and wages than older workers, and the labor market may have to adapt to new demands to be attractive to younger workers.

➔ Upskilling, reskilling and lifelong learning to avoid worker displacement

Technological advancements and the artificial intelligence revolution demand new skill sets which may be leaving workers in low-skilled jobs unable to progress to jobs in emerging sectors. Therefore, opportunities for upskilling and reskilling both in formal educational settings and through on- the-job training are important features of labor market policy. The occupational structure is changing towards more high-skilled occupations. Globally, occupational structures are characterized by slow changes. The result is that it can take time for the labor market to absorb young skilled workers.

➔ **Dynamic Occupational Monitoring for Skill Alignment**

To maximize workforce development and economic growth, surveillance of occupational landscapes gains utmost importance, particularly focusing on the skill requirements. The data reveals varying wage growth among different occupations, underscoring the importance of tracking these factors over time. Globally, occupations have gained significance in wage determination (Acemoglu and Autor, 2012). Although not explicitly outlined in this report, we note comparable trends in recent years within the Saudi labor market. Nevertheless, conducting a thorough analysis requires extensive, long-term data covering extended periods and incorporating wage details and individual characteristics.

➔ **Focused localization efforts**

Saudi workers are entering high-skilled and professional occupations, supported by the education and training system that provides the labor market with the required supply of skilled Saudis. Given this direction, future localization efforts can expand focus on targeting technical professions including IT occupations (data, AI-related jobs, etc.), infrastructure, health, and arts occupations.

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Annex

It's imperative to note that the listed occupations are merely indicative, showcasing occupations with statistically significant representations spanning from 2016 to 2022. The rankings should not be misconstrued to suggest that these specific occupations represent the highest wage growth across all professions. The surge in certain occupations and corresponding wage trends is a result of intricate factors such as economic diversification initiatives, technological advancements, AI integration, and shifting skill compositions, all intricately intertwined with demographic dynamics.

To interpret the lists accurately, it's crucial to recognize that wages serve as a condensed reflection of these multifaceted effects. This public version abstains from presenting exhaustive occupation lists for wage growth due to two primary reasons: firstly, wages are influenced by diverse factors, including supply and demand imbalances; secondly, not all occupations boast comparable data throughout all years in our analysis, owing to various factors encompassing potential misreporting, alterations in occupation definitions, and shifts in perceived job characteristics aligning with a specific occupation in one year and differing in another. Delving into the nuanced analysis of wage growth within occupations necessitates a discerning understanding of industry-specific and economy-wide determinants, an in-depth exploration reserved for more specialized reports.

Annex

Change in wages

ISCO	Occupation	2016-2022	2019-2022
211201	Meteorologist	218%	50%
252202	Network Management Specialist	142%	29%
262103	Curator	130%	42%
243106	Commercial Specialist	127%	29%
214601	Mining Engineer	123%	6%
216502	Cartographer	121%	20%
226901	Occupational Therapist	112%	15%
265502	Movie and Television Actor	110%	27%
265106	Paintings Restoration Specialist	109%	51%
216506	Mining Surveyor	103%	19%
264103	Scriptwriter	102%	58%
264203	Journalistic Editor	97%	37%
265601	Announcer	93%	55%
212003	Statistician	89%	38%
262101	Archivist	86%	47%
211402	Geophysicist	85%	15%

Source: : General Organization for Social Insurance Database

Select professional occupations with highest wage increase, in %, 2016-2022

Change in wages

ISCO	Occupation	2016-2022	2019-2022
121105	Budget Manager	203%	75%
121301	Economic Development Manager	177%	38%
134516	Admission & Registration Manager	147%	55%
143119	News Agency Manager	137%	58%
121101	Financial Manager	137%	24%
121901	Office Manager	134%	39%
121310	Planning and Development Manager	124%	41%
133010	Call Center Manager	119%	16%
134926	Cultural Affairs Manager	109%	54%
131108	Crop Farm Manager	103%	30%
132415	Logistics Services Manager	99%	23%
134904	Public Works & Facilities Manager	97%	32%
134203	Public Health Manager	96%	35%
132419	Post Office Manager	95%	63%
132108	Power Plant Manager	89%	28%
134406	Social Affairs Manager	85%	29%
122103	Marketing Manager	81%	31%

Source: : General Organization for Social Insurance Database

Select managerial occupations with highest wage increase, in %, 2016-2022

Annex

Change in wages

ISCO	Occupation	2016-2022	2019-2022
312101	Mining Supervisor	160%	13%
311105	Geological Technician	154%	23%
331301	Accounts Assistant	114%	50%
333301	Recruitment Agent	101%	13%
314203	Irrigation Technician	99%	-1%
351101	IT Operations Technician	99%	46%
343201	Exhibition Design Technician	91%	44%
311703	Mining Engineering Technician	91%	34%
312201	Manufacturing Supervisor	89%	43%
331403	Mathematics Assistant	84%	37%
315201	Vessel Traffic Guide	83%	28%
313104	Electric Power Transmission Technician	83%	25%
332402	Commodity Broker	82%	9%
313203	Wastewater Treatment Plant Operator	78%	39%

Source: : General Organization for Social Insurance Database

Select associate/technical occupations with highest wage increase, in %, 2016-2022

Glossary

Public Sector	Includes all government entities such as ministries, authorities, government institutions, municipalities, public schools, universities, institutes, government hospitals, military sectors, and government banks such as the Social Development Bank and the Agricultural Bank, as well as development funds
Occupational Switch	The movement or transition of workers from one sector or type of job to another, often characterized by a shift from public to private employment
Artificial Intelligence (AI)	The simulation of human intelligence in machines, enabling them to perform tasks that typically require human intelligence, such as problem-solving and decision-making
Automation	The use of technology to perform tasks with where human input is minimized
Occupational Structure	The aggregate distribution of occupations in society, classified according to skill level, economic function, or social status
Active Labor Market Policies	Interventions and measures by governments to enhance the functioning of the labor market, such as training programs and job placement services
Entrepreneurship	The process of creating, developing, and managing a new business venture with the aim of generating profits/ creating value
Green Energy	Green energy is energy that can be produced using a method, and from a source, that causes no harm to the natural environment
Demographic Dividend	The economic advantage that can result from a youthful population with a higher proportion of working-age individuals

About the Report

The "KSA Occupations Review" is an annual publication by NLO, focusing on detailed analyses of key sectors and occupations in the Kingdom of Saudi Arabia (KSA). The report delves into crucial topics for the private sector, such as jobs at risk, emerging occupations, skill distribution, and wage trends. Offering insights into the present occupational landscape, changes in occupational structure, and future occupational directions, it traces historical occupational patterns to detect evolving trends and patterns that inform future predictions, and sheds light on employment, education, skills, and wages across various occupations.

Ultimately, the report offers insights for comprehending the Saudi occupational structure, facilitating data-driven decision-making, and contributing to the ongoing development of a robust and dynamic labor market in Saudi Arabia.

