Gender Occupational Segregation and Labour Market Inequalities in the UK: Evidence from Horizontal and Vertical Dimensions

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Abstract

Occupational segregation remains a key mechanism through which gender inequalities are reproduced in contemporary labour markets. Despite substantial increases in women's labour market participation, women and men continue to be unevenly distributed across occupations and hierarchical positions, generating persistent disparities in status, career progression, and economic opportunities. This paper examines gender occupational segregation in the United Kingdom by comparing official labour market data from 2023 and 2025. The analysis focuses on both horizontal segregation, referring to the concentration of women and men in different occupations, and vertical segregation, referring to gender inequalities in access to positions of higher prestige within occupational sectors. The study

combines a relative entropy measure based on the Kullback–Leibler divergence with occupational prestige scale scores estimated for the UK labour market. This approach enables the identification of the most and least gender-segregated occupations and the assessment of gendered hierarchies within sectors such as education, information and communication technologies, and health. Preliminary findings indicate that occupational segregation remains a persistent feature of the UK labour market, with women disproportionately concentrated in lower-prestige positions and men over-represented in higher-prestige roles. Comparing 2023 and 2025 provides new evidence on the extent to which these patterns have persisted or changed amid ongoing labour market transformations. The findings contribute to broader debates on labour market inequalities and social inclusion in Europe by demonstrating how occupational segregation continues to shape unequal employment outcomes. The paper argues that addressing both horizontal and vertical segregation is essential for promoting more inclusive and equitable labour markets.

Keywords: gender occupational segregation; labour market inequalities; occupational stratification; gender inequality; social inclusion; occupational prestige; UK; Kullback–Leibler divergence

1 Introduction

Gender occupational segregation remains a persistent feature of contemporary labour markets. Despite substantial increases in women's labour market participation, women and men continue to be unevenly distributed across occupations and positions of responsibility, contributing to inequalities in earnings, career progression, occupational status, and access to economic opportunities. Reducing these inequalities is closely linked to Sustainable Development Goal 5 on gender equality and remains an important policy concern for organisations such as the OECD and the World Bank (OECD (2018), Das and Kotikula (2019)). At the European level, the Gender Equality Strategy 2020–2025 and the Roadmap for Women's Rights similarly emphasise persistent gender gaps in employment, particularly in low-paid occupations, ICT, emerging technologies, and positions of economic decision-making (European Commision (2020), European Commission: Directorate-General for Justice and Consumers (2025)).

Occupational segregation has two closely related dimensions. Horizontal segregation refers to the concentration of women and men in different occupations and sectors, whereas vertical segregation concerns their unequal distribution across occupational hierarchies, levels of responsibility, and positions of prestige (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 1998). A broad literature attributes these patterns to a combination of structural, institutional, cultural, and individual mechanisms. Early approaches emphasised patriarchal labour market structures (Hartmann (1976)), while subsequent research highlighted occupational queues, gendered preferences, socialisation, and persistent occupational stereotypes (Reskin et al (1990), Hakim (1992), Hakim (2006), Anker (1997), Charles and Grusky

(2004)). Related concepts such as the "leaky pipeline", "glass ceiling", "glass escalator", and "sticky floor" describe mechanisms through which gender inequalities are reproduced across occupational careers (Blickenstaff (2005), Cotter et al (2001), Williams (2014), Booth et al (2003)).

Evidence from European labour markets shows that occupational segregation persists even where gender-equality policies are relatively well developed, although its extent varies across institutional and welfare-state contexts (Karamessini et al (2019), Karamessini et al (2016), Symeonaki et al (2019), Stamatopoulou et al (2022), Rubery and Rafferty (2013)). Economic crises and broader labour market transformations may also affect women and men differently because of their unequal concentration across sectors and occupations (Piłatowska and Witkowska (2022), Bettio and Verashchagina (2009)). In the UK, gender inequalities remain evident in occupational allocation, earnings, access to employment, and career progression, while economic downturns and the COVID-19 crisis have further demonstrated the importance of sectoral and occupational segregation in shaping gendered labour market outcomes (Leoncini et al (2024), Francis-Devine and Hutton (2024), Office (2019a,b), Olsen et al (2018), Kamerāde and Richardson (2018), Francis-Devine (2021), Périvier (2014), Razzu and Singleton (2018), ClosetheGap (2020)).

Although occupational segregation has been extensively studied, there remains scope for quantitative approaches that capture both the magnitude of gender imbalance across occupations and its relationship with occupational status. The present study addresses this issue by examining gender occupational segregation in the UK in 2023 and 2025. The analysis has two main objectives. First, it measures horizontal segregation by assessing the divergence between the gender composition of individual occupations and the overall gender distribution of the labour market. Second, it examines vertical segregation by combining occupational gender representation with contemporary occupational prestige scores. The comparison between 2023 and 2025 makes it possible to assess not only the persistence of gender segregation but also changes in its occupational and hierarchical structure over time.

The analysis uses data from NOMIS, the UK Official Census and Labour Market Statistics[1]. Horizontal segregation is measured using the Kullback–Leibler divergence (D_{KL}), which quantifies the difference between the observed gender distribution within an occupation and the overall distribution of women and men in the labour market. This provides a common metric for ranking occupations according to the extent of gender imbalance and for comparing segregation patterns across the two years. The usefulness of the Kullback–Leibler divergence for analysing labour market inequalities has previously been demonstrated by Symeonaki (2022).

To examine vertical segregation, the analysis incorporates the updated UK occupational prestige scale developed by Newlands and Lutz (2024). Combining gender representation with occupational prestige makes it possible to investigate whether women and men are concentrated not only in different occupations but also at different levels of the occupational hierarchy. Particular attention is given to sectors in which gendered patterns are especially relevant, including education, information and communication technologies, health, and engineering and technical occupations. In

[1] https://www.nomisweb.co.uk

this way, the study provides a joint assessment of horizontal and vertical segregation and examines whether these patterns persisted or changed between 2023 and 2025.

The remainder of the paper is structured as follows. Section 2 presents the data and methodology, including the Kullback–Leibler divergence and occupational prestige measures. Section 3 presents and compares the empirical results for 2023 and 2025, while Section 4 discusses the main findings and concludes with implications for future research and policy.

2 Data and Methodology

The analysis uses data from NOMIS, the UK Official Census and Labour Market Statistics platform, to examine horizontal and vertical gender segregation in the UK labour market in 2023 and 2025 (ONS (2024)). The data provide detailed employment counts by gender and occupation and are classified according to the UK Standard Occupational Classification 2020 (SOC 2020). SOC 2020 organises occupations according to skill level and skill specialisation and distinguishes nine major occupational groups, ranging from Managers, Directors and Senior Officials to Elementary Occupations.

The analysis considers two dimensions of occupational segregation, horizontal and vertical segregation, presented in the following subsections.

2.1 Horizontal segregation

Horizontal gender segregation is measured using the Kullback–Leibler divergence, or relative entropy measure, denoted by D_{KL}. The measure quantifies the difference between an observed probability distribution and a reference distribution (Kullback and Leibler, 1951). For two discrete probability distributions P and Q, it is defined as:

$$D_{KL}(P \parallel Q) = \sum_{x \in X} P(x) \ln \left(\frac{P(x)}{Q(x)} \right). \tag{1}$$

In the present analysis, P_i represents the gender distribution within occupation i, while Q represents the overall gender distribution in the UK labour market. The horizontal segregation measure for occupation i is therefore:

$$HS_i = D_{KL}(P_i \parallel Q) = P_{m_i} \ln \left(\frac{P_{m_i}}{Q_m} \right) + P_{f_i} \ln \left(\frac{P_{f_i}}{Q_f} \right), \tag{2}$$

where P_{m_i} and P_{f_i} are the proportions of men and women in occupation i, and Q_m and Q_f are their respective proportions in the overall labour market.

The value of D_{KL} is equal to zero when the gender composition of an occupation is identical to the overall labour-market gender distribution. Higher values indicate a greater departure from the reference distribution and therefore a higher degree of gender segregation. This allows occupations to be ranked from the least to the most gender-segregated and makes it possible to compare changes in occupational gender composition between 2023 and 2025.

For the year 2023, the reference distribution is approximately $Q_m = 0.524$ for men and $Q_f = 0.476$ for women. In 2025, the corresponding proportions are approximately

$Q_m = 0.520$ and $Q_f = 0.480$. Using the year-specific labour-market distribution as the reference ensures that the measure captures occupational imbalance relative to the overall gender composition in each year.

Compared with aggregate measures such as the Index of Dissimilarity, the D_{KL} measure has the advantage of providing an occupation-specific measure of divergence. It therefore allows individual occupations to be identified and ranked according to the extent of their gender imbalance rather than summarising segregation only at the labour-market level.

2.2 Vertical segregation

Vertical segregation is examined using the occupational prestige scale developed by Newlands and Lutz (2024). The scale provides contemporary estimates of occupational prestige in the UK on a 0–100 scale, where higher scores indicate greater perceived occupational status. Because the prestige measure is based on ISCO-08 classifications, SOC 2020 occupations included in the analysis are converted to the corresponding ISCO-08 categories using official classification correspondence tables.

The analysis focuses on selected sectors in which occupational hierarchies and career progression are particularly relevant: Education, Human Health and Social Work, Information and Communication Technologies, and Engineering and Technical Occupations. Occupations within each sector are ordered according to their prestige scores in order to examine whether men and women are concentrated at different levels of the occupational hierarchy.

To account for the overall gender composition of each sector, two relative representation indicators are calculated. Female over-representation is measured as:

$$K_f = \frac{\text{Female proportion in occupation } i}{\text{Overall female proportion in the sector}}, \tag{3}$$

while male over-representation is measured as:

$$K_m = \frac{\text{Male proportion in occupation } i}{\text{Overall male proportion in the sector}}. \tag{4}$$

Values greater than 1 indicate over-representation of the respective gender relative to its overall share in the sector, while values below 1 indicate under-representation. These indicators make it possible to distinguish gender imbalances that arise from the general composition of a sector from those associated with particular occupations.

For each sector, occupations are plotted in ascending order of occupational prestige, while the K_m and K_f indicators are shown on the vertical axis. This makes it possible to assess whether gender over-representation is concentrated at particular levels of occupational prestige and to compare the structure of vertical segregation between 2023 and 2025.

3 Results

3.1 Horizontal segregation

The horizontal segregation analysis compares the gender composition of occupations in the UK in 2023 and 2025 using the Kullback–Leibler divergence measure. Lower D_{KL} values indicate that an occupation's gender distribution is closer to the overall labour-market distribution, while higher values indicate greater gender segregation.

At the level of the nine major occupational groups, the overall structure of gender segregation remained highly stable between 2023 and 2025 (Tables 1 and 2). Elementary Occupations were the least segregated group in both years, followed closely by Professional and Associate Professional Occupations. In contrast, Skilled Trades Occupations and Process, Plant and Machine Operatives remained the most strongly male-dominated groups, while Caring, Leisure and Other Service Occupations and Administrative and Secretarial Occupations remained strongly female-dominated.

The main change among the least segregated major groups was the reversal in the ordering of Professional and Associate Professional Occupations. In 2023, Professional Occupations recorded the second-lowest D_{KL} value, whereas in 2025 Associate Professional Occupations became slightly less segregated. However, this change was small, and the broader ordering of the major groups remained largely unchanged. This suggests that the overall structure of occupational gender segregation in the UK labour market was relatively persistent over the two-year period.

Table 1 Gender segregation according to the $D_{KL}(P \parallel Q)$ values for the nine major occupational groups in the UK, 2023

Major groups	**Male %**	**Female %**	$D_{KL}(P \parallel Q)$
9: Elementary Occupations	52.36	47.64	0.000000
2: Professional Occupations	51.52	48.48	0.000164
3: Associate Professional Occupations	50.82	49.18	0.000499
1: Managers, Directors and Senior Officials	63.07	36.93	0.023158
7: Sales and Customer Service Occupations	40.30	59.71	0.029465
4: Administrative and Secretarial Occupations	26.94	73.06	0.133736
6: Caring, Leisure and Other Service Occupations	20.40	79.61	0.216892
8: Process, Plant and Machine Operatives	87.32	12.68	0.278260
5: Skilled Trades Occupations	88.80	11.19	0.306478

Tables 3 and 4 extend the analysis to the SOC 2020 unit-group level and identify the 20 least gender-segregated occupations in each year. At this more detailed level, considerably more change is observed. Only a small number of occupations appeared in the top 20 in both years, including Specialist Medical Practitioners, Managers and Directors in the Creative Industries, Quality Assurance and Regulatory Professionals, Packers, Bottlers, Canners and Fillers, and Catering and Bar Managers.

Several occupations that were among the least segregated in 2023, such as Data Entry Administrators, Customer Service Supervisors, Paramedics, Shelf Fillers, and Elementary Cleaning Occupations n.e.c., no longer appeared in the 2025 ranking. Conversely, the 2025 list included a number of professional, managerial, financial,

Table 2 Gender segregation according to the $D_{KL}(P \parallel Q)$ values for the nine major occupational groups in the UK, 2025

Major groups	**Male %**	**Female %**	$D_{KL}(P \parallel Q)$
9: Elementary Occupations	52.09	47.92	0.000035
3: Associate Professional Occupations	50.75	49.25	0.000315
2: Professional Occupations	50.53	49.47	0.000436
1: Managers, Directors and Senior Officials	62.24	37.77	0.021257
7: Sales and Customer Service Occupations	40.62	59.38	0.026034
4: Administrative and Secretarial Occupations	27.22	72.77	0.126728
6: Caring, Leisure and Other Service Occupations	21.76	78.24	0.192726
8: Process, Plant and Machine Operatives	87.74	12.27	0.291557
5: Skilled Trades Occupations	87.93	12.07	0.295164

and technical occupations that were not present in the 2023 top 20, including Financial Accounts Managers, Insurance Underwriters, Generalist Medical Practitioners, Research and Development Managers, and Biological Scientists. Specialist Medical Practitioners showed one of the most notable changes, moving from 16th position in 2023 to the least segregated occupation in 2025.

The comparison therefore reveals an important distinction between aggregate and detailed patterns. At the major-group level, occupational segregation remained broadly stable, whereas at the unit-group level the composition of the least segregated occupations changed substantially. This indicates that changes in gender balance may occur within broad occupational groups without necessarily altering the overall structure of segregation across the labour market.

Table 3 Top 20 least gender-segregated occupations in the UK, 2023, based on the D_{KL} measure

Occupation Code and Title	**Segregation Score**
4152: Data Entry Administrators	0.0000012
7220: Customer Service Supervisors	0.0000017
2255: Paramedics	0.0000164
9241: Shelf Fillers	0.0000166
1222: Restaurant and Catering Establishment Managers and Proprietors	0.0000873
9229: Elementary Cleaning Occupations n.e.c.	0.0001213
2439: Business, Research, and Administrative Professionals n.e.c.	0.0001427
9132: Packers, Bottlers, Canners, and Fillers	0.0002519
5112: Horticultural Trades	0.0010148
1255: Managers and Directors in the Creative Industries	0.0010811
2482: Quality Assurance and Regulatory Professionals	0.0012847
3413: Actors, Entertainers, and Presenters	0.0013713
9131: Industrial Cleaning Process Occupations	0.0013802
3574: Other Vocational and Industrial Trainers	0.0022037
2311: Higher Education Teaching Professionals	0.0023888
2212: Specialist Medical Practitioners	0.0025007
2113: Biochemists and Biomedical Scientists	0.0026135
4134: Transport and Distribution Clerks and Assistants	0.0031944
5436: Catering and Bar Managers	0.0032702
3111: Laboratory Technicians	0.0032870

Table 4 Top 20 least gender-segregated occupations in the UK, 2025, based on the D_{KL} measure

Occupation Code and Title	Segregation Score
2212: Specialist Medical Practitioners	0.0000007
1221: Hotel and Accommodation Managers and Proprietors	0.0000015
2440: Business and Financial Project Management Professionals	0.0000018
3534: Financial Accounts Managers	0.0000019
1139: Functional Managers and Directors n.e.c.	0.0000072
3532: Insurance Underwriters	0.0000412
3133: Database Administrators and Web Content Technicians	0.0000481
2211: Generalist Medical Practitioners	0.0000959
2161: Research and Development (R&D) Managers	0.0002105
2112: Biological Scientists	0.0003541
1255: Managers and Directors in the Creative Industries	0.0004026
5436: Catering and Bar Managers	0.0004776
7132: Sales Supervisors – Retail and Wholesale	0.0005561
9132: Packers, Bottlers, Canners and Fillers	0.0006970
8112: Textile Process Operatives	0.0008052
9269: Other Elementary Services Occupations n.e.c.	0.0008524
4143: Customer Service Managers	0.0009213
2482: Quality Assurance and Regulatory Professionals	0.0009904
6132: Ambulance Staff (excluding Paramedics)	0.0011417
2421: Chartered and Certified Accountants	0.0013134

A further indication of change is provided by occupations with complete gender homogeneity. In 2023, four occupations were recorded as 100% female and twenty as 100% male, compared with one fully female occupation and fourteen fully male occupations in 2025. Several occupations nevertheless remained completely male-dominated in both years, including Pipe Fitters, Air-Conditioning and Refrigeration Installers and Repairers, TV, Video and Audio Servicers and Repairers, Steel Erectors, Plasterers, Tyre, Exhaust and Windscreen Fitters, and Scaffolders, Stagers and Riggers.

The reduction in the number of completely gender-homogeneous occupations suggests some movement away from the most extreme forms of horizontal segregation between 2023 and 2025.

The most highly segregated occupations provide a complementary picture. In both 2023 and 2025, the occupations with the largest D_{KL} values were concentrated in strongly gender-typed areas of work. Female-dominated occupations were particularly common in childcare, nursing, health-related services, and personal services, while male-dominated occupations were concentrated in construction, skilled trades, transport, and technical occupations.

There was nevertheless some change in the specific occupations appearing among the 20 most segregated. Early Education and Childcare Assistants, Florists, Carpenters and Joiners, Plumbers and Heating and Ventilating Installers and Repairers, and Speech and Language Therapists remained among the most segregated occupations across the two years, indicating persistence in particular occupational gender patterns. At the same time, several new occupations entered the 2025 ranking, including Children's Nurses, Beauticians and Related Occupations, Early Education and Childcare

Table 5 Female-dominated and male-dominated occupations with 100% representation of one gender in the UK, 2023

Female-Dominated Occupations (Female representation: 100%)	**Male-Dominated Occupations (Male representation: 100%)**
2231: Midwifery Nurses	3112: Electrical and Electronics Technicians
4217: Typists and Related Keyboard Occupations	3512: Ship and Hovercraft Officers
6116: Nannies and Au Pairs	5214: Pipe Fitters
7212: Telephonists	5222: Tool Makers, Tool Fitters, and Markers-Out
	5225: Air-Conditioning and Refrigeration Installers and Repairers
	5233: Vehicle Paint Technicians
	5243: TV, Video, and Audio Servicers and Repairers
	5246: Electrical Service and Maintenance Mechanics and Repairers
	5311: Steel Erectors
	5312: Stonemasons and Related Trades
	5313: Bricklayers
	5321: Plasterers
	5322: Floorers and Wall Tilers
	8132: Mining and Quarry Workers and Related Operatives
	8133: Energy Plant Operatives
	8145: Tyre, Exhaust, and Windscreen Fitters
	8151: Scaffolders, Stagers and Riggers
	8153: Rail Construction and Maintenance Operatives
	9112: Forestry and Related Workers
	9121: Groundworkers

Services Managers, Bricklayers, Large Goods Vehicle Drivers, Fork-Lift Truck Drivers, and Community Nurses.

To conclude, the horizontal segregation analysis reveals that the broad occupational structure of gender segregation remained largely unchanged between 2023 and 2025, with care-related and administrative occupations continuing to be female-dominated and skilled trades, construction, and machine-operating occupations remaining male-dominated. At the same time, the detailed occupational rankings show greater movement, suggesting that changes in gender representation are taking place within occupational groups even where the overall structure remains persistent.

3.2 Vertical segregation

The analysis of vertical segregation, based on prestige scores and gender distributions, reveals also significant patterns of occupational stratification and gender disparities in the majority of sectors under survey.

Within the broader category of Teaching and Other Educational Professionals, the overall gender distribution is 31.94% male and 68.06% female for 2023, compared

Table 6 Female-dominated and male-dominated occupations with 100% representation of one gender in the UK, 2025

Female-Dominated Occupations (Female representation: 100%)	**Male-Dominated Occupations (Male representation: 100%)**
4217: Typists and Related Keyboard Occupations	5211: Sheet Metal Workers
	5212: Metal Plate Workers, Smiths, Moulders and Related Occupations
	5214: Pipe Fitters
	5225: Air-Conditioning and Refrigeration Installers and Repairers
	5232: Vehicle Body Builders and Repairers
	5243: TV, Video and Audio Servicers and Repairers
	5311: Steel Erectors
	5314: Roofers, Roof Tilers and Slaters
	5321: Plasterers
	6121: Pest Control Officers
	8145: Tyre, Exhaust and Windscreen Fitters
	8151: Scaffolders, Stagers and Riggers
	8221: Crane Drivers
	8233: Air Transport Operatives

with 34% and 66% respectively, in 2025. Although the education sector is dominated by women, a clear pattern of gender vertical segregation is detected, with females concentrated in lower-prestige roles and males in higher-prestige ones. In particular, occupations such as Early education and childcare practitioners and assistants, Nannies and au pairs, Childminders and Teaching assistants are highly feminised, as reflected in K_f values ($K_f > 1.20$), indicating a strong association of women with nurturing and care-oriented roles across both years under study. This trend continues in mid-range prestige jobs, particularly in supportive and teaching roles, such as Primary education teaching professionals ($K_f = 1.10$), Nursery education teaching professionals and Early education and childcare services managers ($K_f = 1.27$ in 2023 and $K_f = 1.30$ in 2025), which remain predominantly female. Besides, in other mid-range prestige occupations, the trend shows a slight increase in male representation or a more balanced gender distribution. As prestige scores rise, male representation becomes more prominent. Thus, for leadership and academic positions, including Head teachers and principals ($K_m = 1.60$ in 2023 and $K_m = 1.74$ in 2025) and Secondary and Higher education teaching professionals ($K_m = 1.60$ and 2.28 in 2023; $K_m = 1.70$ and 2.21 in 2025), the proportion of male professionals rises significantly, reflecting a clear pattern of vertical segregation, where men are more likely to occupy high-prestige, leadership, or strategic roles.

Thus, the results suggest that despite women's dominance in the Education sector, they face barriers to advancing into higher-prestige roles. The analysis highlights how societal expectations and structural factors contribute to the feminisation of care-oriented and lower-prestige roles while favouring men in leadership and prestigious

Table 7 Top 20 most gender-segregated occupations in the UK, 2023, based on the D_{KL} measure, excluding occupations with 100% representation of one gender

Occupation	Segregation Score
6111: Early Education and Childcare Assistants	0.6728099
5443: Florists	0.6602864
4214: Company Secretaries and Administrators	0.6468601
4213: School Secretaries	0.6146887
5317: Glaziers, Window Fabricators, and Fitters	0.6142467
4215: Personal Assistants and Other Secretaries	0.6125300
4211: Medical Secretaries	0.6091276
5316: Carpenters and Joiners	0.6057734
5232: Vehicle Body Builders and Repairers	0.6044713
5241: Electricians and Electrical Fitters	0.6027182
5213: Welding Trades	0.5969584
8229: Mobile Machine Drivers and Operatives n.e.c.	0.5945453
5234: Aircraft Maintenance and Related Trades	0.5845228
5231: Vehicle Technicians, Mechanics, and Electricians	0.6145752
5315: Plumbers and Heating and Ventilating Installers and Repairers	0.5521831
5314: Roofers, Roof Tilers, and Slaters	0.5508740
9225: Refuse and Salvage Occupations	0.5502043
2223: Speech and Language Therapists	0.5152178
6133: Dental Nurses	0.5105922
3240: Veterinary Nurses	0.4955746

Table 8 Top 20 most gender-segregated occupations in the UK, 2025, based on the D_{KL} measure, excluding occupations with 100% representation of one gender

Occupation	Segregation Score
6133: Dental Nurses	0.7037353
6116: Nannies and Au Pairs	0.6765716
2223: Speech and Language Therapists	0.6597817
6111: Early Education and Childcare Assistants	0.6518789
5316: Carpenters and Joiners	0.6378967
2236: Children's Nurses	0.6299984
6222: Beauticians and Related Occupations	0.6211437
2324: Early Education and Childcare Services Managers	0.6089892
5313: Bricklayers	0.6072502
8211: Large Goods Vehicle Drivers	0.6050240
8222: Fork-Lift Truck Drivers	0.6027389
2232: Community Nurses	0.5957300
5443: Florists	0.5813239
3232: Early Education and Childcare Practitioners	0.5730299
9121: Groundworkers	0.5662321
2315: Nursery Education Teaching Professionals	0.5648047
5235: Boat and Ship Builders and Repairers	0.5603315
5315: Plumbers and Heating and Ventilating Installers and Repairers	0.5595500
5245: Security System Installers and Repairers	0.5563560
5233: Vehicle Paint Technicians	0.5547676

academic positions. Figures 1 and 2 provide a visual representation of vertical segregation within the Education sector in the UK. Occupations are displayed on the x-axis in ascending order according to their prestige scores, while the y-axis illustrates the K_m

and K_f indicators. Both graphs reveal a clear pattern: women are disproportionately represented in lower-prestige occupations, whereas men are predominantly found in higher-prestige roles. The pattern remained relatively stable between 2023 and 2025, despite some changes in gender representation across individual occupations.

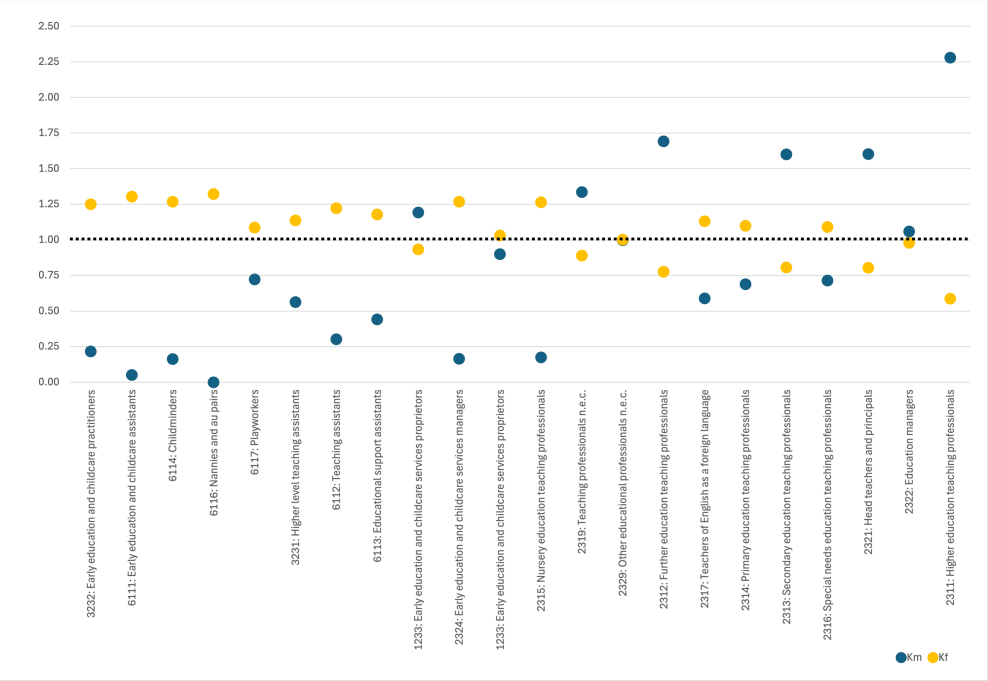

Fig. 1 Over-representation and under-representation of men and women in occupations within the Education sector, the UK, 2023

The Health sector (Figures 3 and 4) demonstrate also a gender-based occupational segregation, with women predominantly occupying caregiving and support roles and men being overrepresented in several high-prestige, leadership, and technical roles. In particular, for 2023 high prestige roles such as Generalist medical practitioners ($K_m = 1.19$) and Specialist medical practitioners ($K_m = 2.32$) have high male representation, while roles such as Speech and language therapists ($K_f = 1.24$) and Community or children's nurses ($K_f = 1.22$) exhibit a predominance of females, showcasing the gender disparity within healthcare professions. The higher the prestige score, the more likely it is that the position is male-dominated, particularly in roles like Paramedics ($K_m = 2.19$) and Veterinarians ($K_m = 1.26$). These roles tend to offer a higher level of autonomy, responsibility, and expertise, thus contributing to their higher prestige. On the other hand, lower prestige roles such as Care workers and home carers and Houseparents and residential wardens are heavily female-dominated.

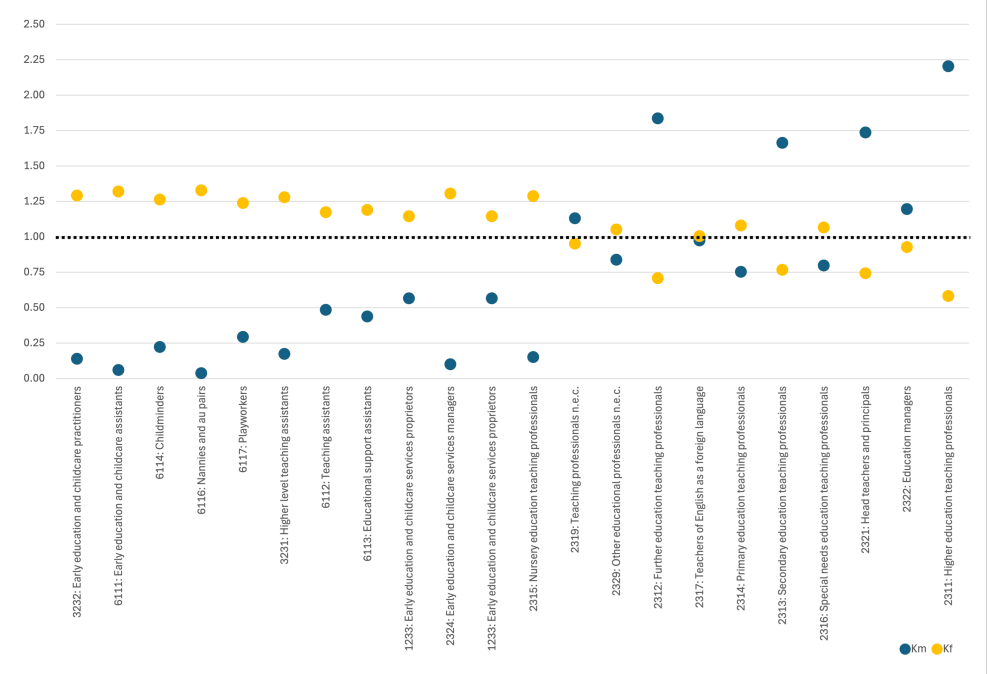

Fig. 2 Over-representation and under-representation of men and women in occupations within the Education sector, the UK, 2025

These roles typically involve more caregiving tasks that are often undervalued, contributing to lower prestige scores. Similarly, roles like Dental nurses ($K_f = 1.24$) and Complementary health associate professionals ($K_f = 1.14$) also show a predominance of women, further reflecting the gender division in healthcare. Additionally, roles that require higher levels of training, such as Physiotherapists and Optometrists, tend to have a more gender-balanced distribution (with values of K_m and K_f close to 1). Interestingly, specialised medical roles, such as Midwifery nurses ($K_f = 1.32$), show extreme gender disparity with women making up 100% of the workforce in that area.

Compared to 2023, the overall pattern seems to remain stable in 2025 (Figure 4). Besides, the results show more pronounced gender imbalances in several occupations, particularly in terms of male overrepresentation in occupations such as Health services and public health managers and directors or Generalist medical practitioners, where K_m increased substantially. In contrast, nursing and care-related occupations remain strongly female-dominated, particularly Children's Nurses, Community Nurses and Midwifery Nurses. However, this pattern is not uniform across all high-skilled occupations, with occupations such as Veterinarians showing a more balanced representation.

In conclusion, the Health sector displays significant vertical gender segregation. The roles that hold higher prestige, generally requiring higher levels of expertise or education, tend to be more male-dominated. In contrast, care-oriented professions,

often associated with lower prestige, remain heavily female-dominated. This gender disparity in the distribution of prestige and job roles highlights a deep-rooted societal trend in the healthcare workforce, where traditional gender roles influence both career choice and the perceived value of different professions. This highlights the need for further research into how gender influences career advancement, job satisfaction, and the broader recognition of healthcare professionals. It is also consistent with existing literature showing that occupational titles such as "nurse" and "doctor" are heavily gender-stereotyped, even among children as young as three years old and continuing through adolescence (Fox and Barth (2017); Blakemore (2003); Katz and Ksansnak (1994); Liben and Bigler (2002)). Figures 3 and 4 reveal the aforementioned trend, showing a more balanced distribution in the intermediate range of occupations within the sector. However, women remain over-represented in several occupations with the lowest prestige scores, while men dominate the occupations with the highest prestige scores, as measured by the prestige scale.

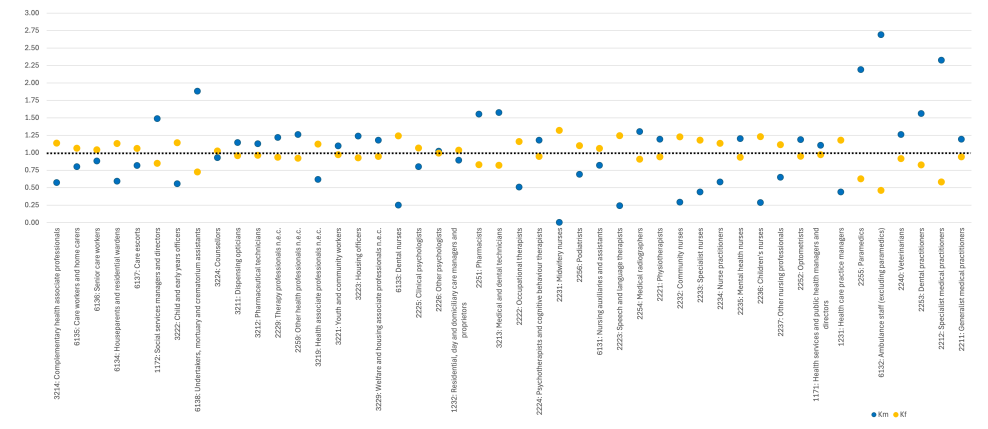

Fig. 3 Over-representation and under-representation of men and women in occupations within the Heath sector, the UK, 2023

The analysis of vertical segregation in the Information and Communication Technology (ICT) sector highlights notable patterns of gender distribution across occupations with varying prestige scores. Figures 5 and 6 visualise these trends. At the higher end of the prestige scale, occupations such as Telecommunications Engineers and IT network professionals exhibit significant male over-representation. This pattern is reflected in K_m values of 1.19 and 1.12, respectively, in 2023, indicating a higher proportion of men relative to their overall presence in the sector. Similarly, roles such as Programmers and software development professionals and Information technology directors also show elevated male representation, with K_m values of 1.05 and 1.03. The same pattern is observed in 2025, with similar K_m values across these occupations.

Conversely, female over-representation is concentrated in lower prestige occupations and in less technical and leadership positions. In 2023, Database administrators

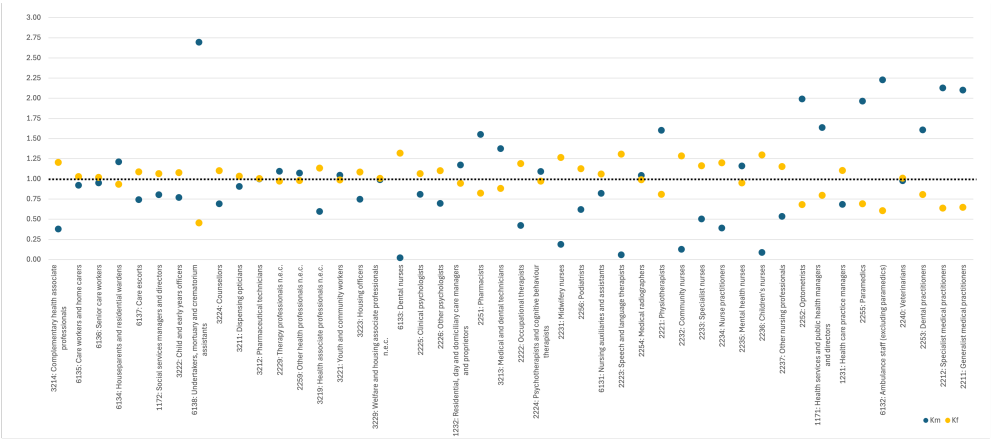

Fig. 4 Over-representation and under-representation of men and women in occupations within the Heath sector, the UK, 2025

and web content technicians and Web design professionals exhibit K_f values of 1.84 and 1.79, respectively, indicating a higher proportion of women relative to their overall presence in the sector. On the other hand, no occupations in the ICT sector show substantial female over-representation at the highest prestige levels, further highlighting the asymmetry in gender distribution. Interestingly, notable changes are detected between the two years in some female-dominated occupations. In particular, female over-representation increase among Information Technology Trainers, with K_f rising from 1.22 in 2023 to 1.98 in 2025, as well as among Database Administrators and Web Content Technicians (1.84 to 2.33) and Web Design Professionals (1.79 to 2.20). Additionally, some occupations in the ICT sector display relatively balanced gender representation, as evidenced by K_m and K_f values close to 1.

In general, the observed trends in the ICT sector underscore the persistence of vertical segregation, where men are concentrated in leadership-oriented higher-prestige roles, while women are overrepresented in support-oriented lower-prestige roles. Research consistently demonstrates that male-dominated occupations, such as those in information and communication technologies (ICT), are strongly associated with masculinity (Cejka and Eagly (1999); Gaucher et al (2011)). These gendered perceptions persist across occupational hierarchies (e.g., leadership versus support roles), academic domains (e.g., STEM versus humanities), and even within specific professions, where, for example, surgeons are typically perceived as male-typed, while paediatricians are more often viewed as female-typed.

The analysis within the Engineers and Technicians sector depicted in Figure 7 reveals distinct patterns of gender distribution across occupations, as evidenced by the K_m and K_f indices. This sector includes a wide range of roles, from highly specialised engineers to technical support staff, with notable variation in gender representation. At the higher end of male representation, roles such as Electricians and Electrical Fitters, Electrical and Electronics Technicians, and Security System Installers and Repairers exhibit a modest male over-representation, with K_m slightly exceeding 1. Similarly,

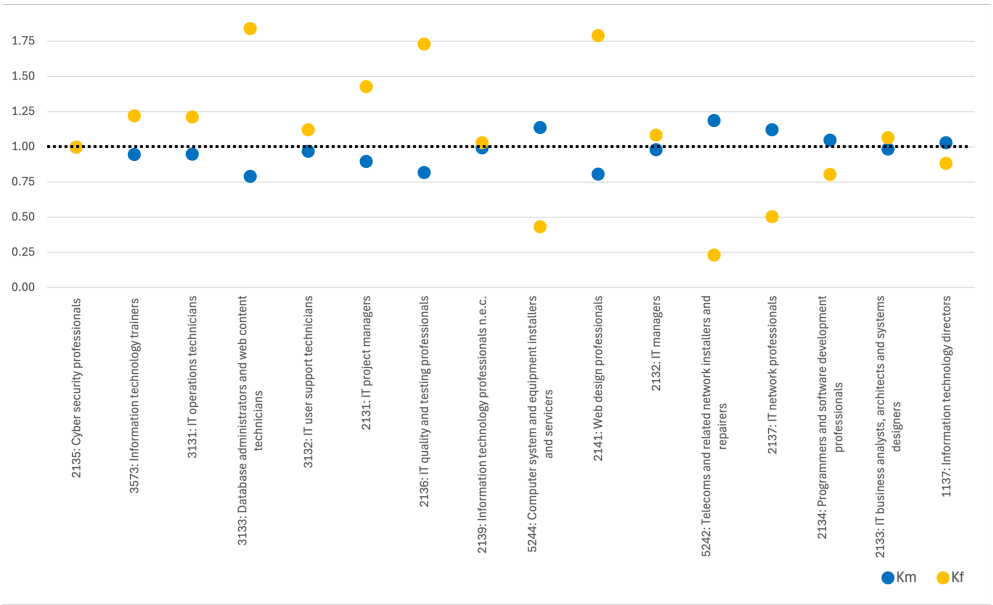

Fig. 5 Over-representation and under-representation of men and women in occupations within the ICT sector, the UK, 2023

professions like Telecoms and related network installers and repairers ($K_m = 1.05$), Electrical engineers ($K_m = 1.08$), Engineering Project Managers and Project Engineers ($K_m = 1.01$) and Mechanical engineers ($K_m = 1.02$) also demonstrate a small male dominance, underscoring a trend where men are somehow concentrated in technical and leadership-oriented roles within the sector. On the other hand, significant female over-representation is evident in several lower-prestige or support-oriented occupations. Planning, process, and production technicians ($K_f = 2.51$) and CAD, Drawing, and Architectural Technicians ($K_f = 2.68$) are prime examples of female-dominated roles. Additionally, Science, Engineering, and Production Technicians n.e.c. ($K_f = 3.4$) and Quality Assurance Technicians ($K_f = 2.01$) also display substantial female representation, as indicated by their high K_f values. These trends highlight a clustering of women in positions that are often perceived as supportive or auxiliary within the broader engineering and technical fields.

Certain occupations also exhibit stark gender asymmetries. For example, roles such as Electricians and Electrical Fitters ($K_f = 0.08$) and Engineering Professionals n.e.c. ($K_f = 0.23$) show minimal female representation. Moreover, no roles demonstrate pronounced female over-representation at the highest levels of male dominance, further highlighting vertical segregation. Conversely, some roles show relatively balanced gender representation, with K_m and K_f values closer to 1. For instance, Building and Civil Engineering Technicians ($K_m = 0.91$, $K_f = 1.87$) and Civil Engineers ($K_m = 0.98$, $K_f = 1.15$) reflect a more equitable distribution of men and women. However, even in these cases, subtle disparities in representation persist. Overall, the observed patterns

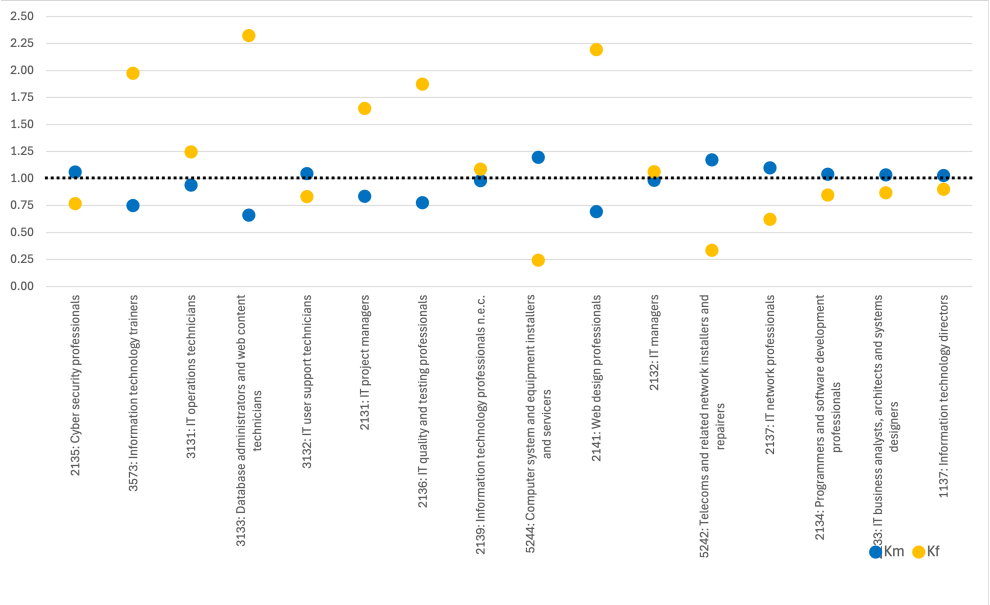

Fig. 6 Over-representation and under-representation of men and women in occupations within the ICT sector, the UK, 2025

within the Engineers and Technicians sector underscore the persistence of gender-based occupational segregation. Men continue to dominate higher-prestige, technically specialised, and leadership roles, while women are overrepresented in lower-prestige, support-oriented, or niche technical occupations. These trends suggest ongoing barriers to achieving gender equity across this sector.

The analysis of the Engineers and Technicians sector in 2025 continues to reveal substantial gender differentiation across occupations, although the pattern differs in several respects from that observed in 2023. As shown in Figure 8, a number of occupations remain characterised by male over-representation. Security System Installers and Repairers, Computer System and Equipment Installers and Servicers, Telecoms and Related Network Installers and Repairers, and Electrical Engineers display relatively high K_m values together with low K_f values, indicating the continued concentration of men in specialised electrical, installation, and network-related occupations. Mechanical Engineers and Aerospace Engineers also remain male-leaning, although the degree of imbalance is less pronounced.

At the same time, several technical and engineering occupations show female over-representation in 2025. Quality Assurance Technicians, CAD, Drawing and Architectural Technicians, Science, Engineering and Production Technicians n.e.c., Civil Engineers, and Engineering Project Managers and Project Engineers all record K_f values above 1. The strongest female over-representation is observed among Engineering Professionals n.e.c., where the K_f value is close to 2, while the corresponding K_m value is substantially below 1. This indicates that female over-representation in 2025 is

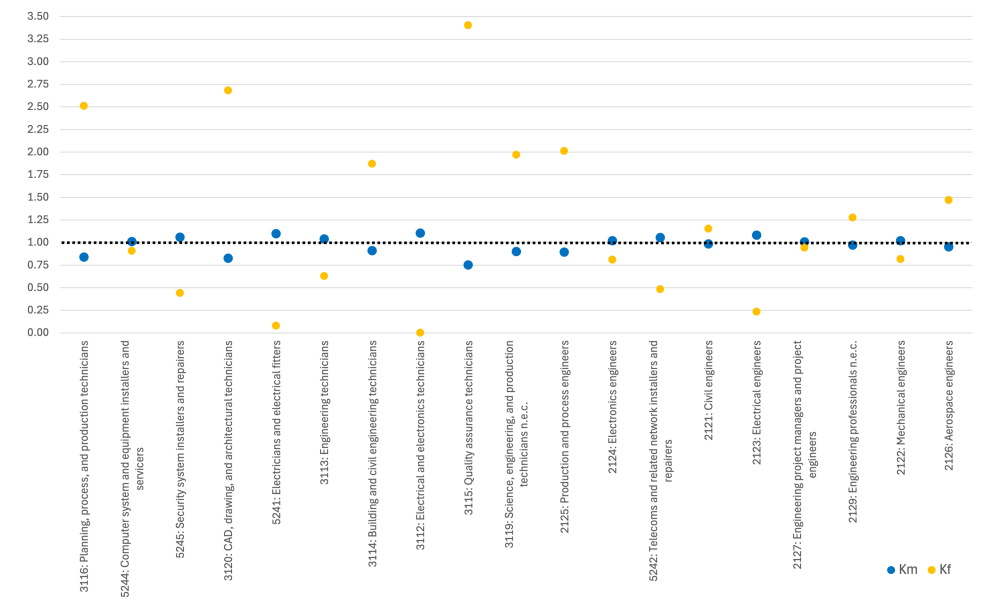

Fig. 7 Over-representation and under-representation of men and women in occupations within the Engineers and Technicians, the UK, 2023

not confined entirely to technical support roles, but is also visible in some professional engineering occupations.

Compared with 2023, several notable changes can be identified. The strong female over-representation previously observed among Planning, Process and Production Technicians has weakened considerably in 2025, with male and female representation now much closer to parity. Female over-representation also remains evident among CAD, Drawing and Architectural Technicians, Quality Assurance Technicians, and Science, Engineering and Production Technicians n.e.c., although the differences are less extreme than those observed in 2023. At the same time, some professional engineering occupations appear to have become relatively more favourable to women. In particular, Civil Engineers, Engineering Project Managers and Project Engineers, and especially Engineering Professionals n.e.c. show stronger female representation in 2025.

Nevertheless, the persistence of high male representation in occupations such as Security System Installers and Repairers, Telecoms and Related Network Installers and Repairers, Electrical Engineers, and other electrical and installation occupations indicates that horizontal gender segregation remains pronounced. The comparison between 2023 and 2025 suggests some redistribution of women from highly concentrated technical-support occupations towards selected professional engineering roles. However, the broader pattern of male dominance in specialised electrical, installation, and engineering occupations remains clearly visible.

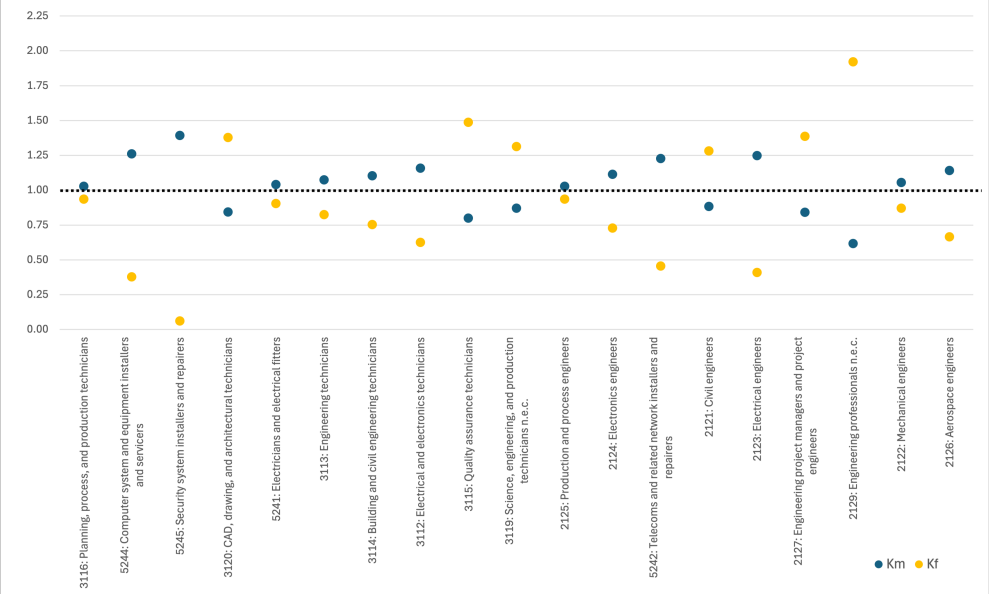

Fig. 8 Over-representation and under-representation of men and women in occupations within the Engineers and Technicians, the UK, 2025

4 Discussion and Conclusions

The paper sheds light on the persistent nature of gender occupational segregation in the UK labour market, and its implications for achieving gender equity in the workforce. By examining both horizontal and vertical dimensions, the research contributes to the growing body of literature on gender inequality in the workplace, offering a nuanced understanding of the barriers that perpetuate gender disparities across various sectors and levels of prestige. With data drawn from NOMIS 2023 and 2025, the study aims to assess the gender distribution in various occupations and to identify areas with significant imbalances using the Kullback–Leibler entropy index. Additionally, the paper introduces a novel method for estimating vertical gender segregation using prestige scale scores tailored specifically to the UK labour market.

The findings reveal a clear pattern of gender occupational segregation both horizontally and vertically, which reflects entrenched societal norms, stereotypes, and structural barriers that continue to influence the workforce. Regarding horizontal occupational segregation, the study concludes that in general women are predominantly found in caregiving, clerical, or support roles, while it appears that they face barriers to accessing certain occupations, especially in technical and specialised fields. In contrast, men are more likely to occupy technical, physical, or leadership positions. This pattern reflects persistent stereotypes, as women's occupation is often undervalued or less skilled, while men work in more demanding occupations. Concerning vertical segregation, the data highlight a clear gender hierarchy in many sectors, where men continue to dominate decision-making and high-prestige roles, and women are less likely to be

represented in senior positions. This reinforces existing inequalities in career advancement and professional growth, restricting women's access to top-tier positions. Across the years, the overall patterns remain relatively stable, as both horizontal and vertical segragation persist from 2023 to 2025. However, some occupations show changes in gender representation, with gender imbalances increasing or decreasing over time.

To address these gender inequalities, policies should be implemented to promote a more equitable and inclusive labour market and to ensure equal access to highly prestigious and leadership occupations.

Declarations

Ethics approval and consent to participate. Not applicable.

Consent for publication. Not applicable.

Data availability. Data supporting Tables 2-8 can be replicated by using publicly available data from NOMIS (official census and labour market statistics, UK) at https://www.nomisweb.co.uk/datasets/aps218/reports/employment-by-occupation?compare=K02000001 and using the definitions and the proposed methodology. The data displayed in Figures 1-8 are based on an analysis of NOMIS data (official census and labour market statistics, UK) at https://www.nomisweb.co.uk/datasets/aps218/reports/employment-by-occupation?compare=K02000001, prestige scale scores from Newlands and Lutz (2024), and the SOC 2020 to ISCO-08 mapping available at https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc.

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