



► **Generative AI and jobs:**
A global analysis of potential
effects on job quantity and
quality

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12 December, 2023

► GenAI and jobs – the challenge of understanding the global picture

- Most recent literature focussed on HIC
- Methods: task-based vs adoption-based approaches (non-HIC complication)
- “*Replacement OR enhancement*” typically cast as the main question
- Are these the only scenarios? Should we worry about other impacts?
- First step: global task-based approach, based on an international standard & ILO data systems



Methodology

ISCO-08 Structure of occupations and tasks used in the study

ISCO-08 1-digit code	ISCO-08 1-digit full label	Nr of distinct 1- digit codes	Nr of distinct 2- digit codes	Nr of distinct 3- digit codes	Nr of distinct 4- digit codes	Total ISCO tasks	Total GPT tasks
0	Armed forces occupations	1	3	3	3	0	30
1	Managers	1	4	11	31	236	310
2	Professionals	1	6	27	92	751	920
3	Technicians and associate professionals	1	5	20	84	580	840
4	Clerical support workers	1	4	8	29	163	290
5	Service and sales workers	1	4	13	40	269	400
6	Skilled agricultural, forestry and fishery workers	1	3	9	18	141	180
7	Craft and related trades workers	1	5	14	66	503	660
8	Plant and machine operators, and assemblers	1	3	14	40	280	400
9	Elementary occupations	1	6	11	33	200	330
	Total	10	43	130	436	3,123	4,360

Python API request (GPT-4):

`{"role": "system", "content": "You are a skills specialist3. You will provide job definitions based on a job title and ISCO code. Follow instructions closely."},`

`{"role": "user", "content": "Look at this ISCO code and job title and provide an international standard definition of this job: " + "Do not provide any other content, just the definition of some 100 words that describes what the job is about and which level of ISCO skills it requires (1-4)." + "ISCO code: " + str(ISCO_08) + "Job Title: " + str(Title)}`

ISCO-08	Definition ISCO	Definition predicted by GPT4
2341	Primary school teachers teach a range of subjects at the primary education level.	Primary School Teachers (ISCO code: 2341) are education professionals responsible for planning, preparing, and delivering lessons and activities to facilitate the cognitive, social, and emotional development of children aged between 5 and 12 years old. They assess students' progress, provide a supportive and inclusive learning environment, and collaborate with parents and other education professionals to ensure the overall well-being and success of students. Primary School Teachers require ISCO skill level 4, which includes a bachelor's degree in education or a related field, and they must possess pedagogical skills, communication skills, and creativity in teaching methodologies.

► Task-level predictions

ISCO-08	Tasks ISCO	Tasks predicted by GPT4
2341	Preparing daily and longer-term lesson plans in accordance with curriculum guidelines; Instructing children individually and in groups, using various teaching methods and materials (e.g. computers, books, games), adapting to children's varying needs; Maintaining discipline and good working habits in the classroom; Planning and conduct activities with the children such as sporting activities, concerts and excursions; Assigning and grading class work and home-work;	Develop lesson plans and daily schedules for a variety of subjects at the primary education level; Teach basic skills such as reading, writing, and arithmetic to students using various teaching methods and tools; Establish and maintain classroom rules to create a positive and structured learning environment; Collaborate with other teachers and school staff to organize events, activities, and educational programs; Provide individualized attention and support to students who are struggling or require additional help;

► Task-level scoring

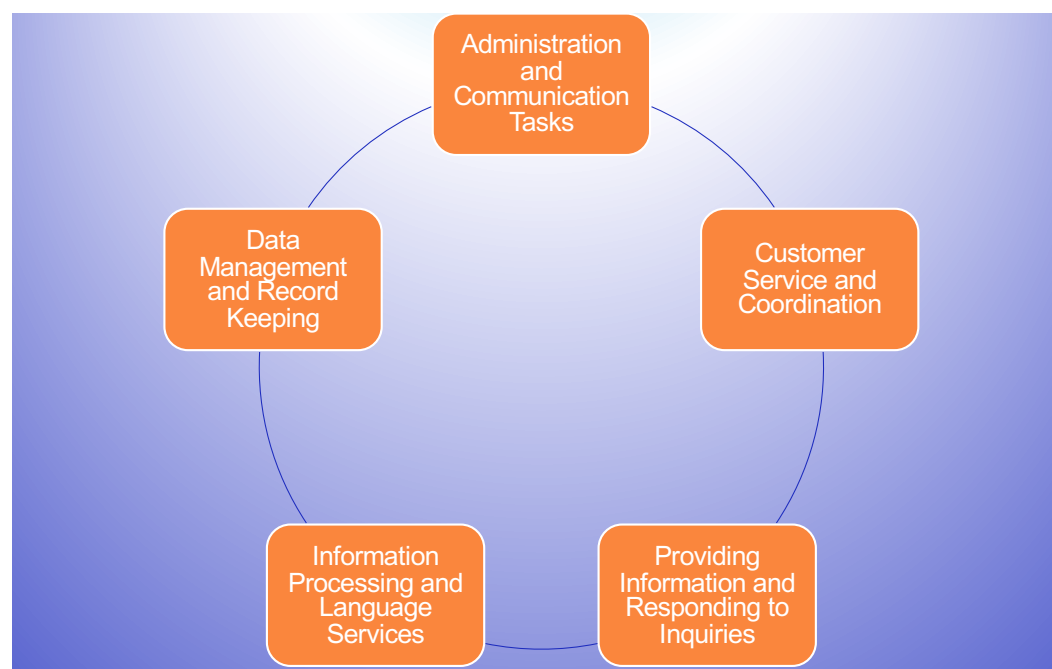
Python API request (GPT-4):

{“role”: “system”, “content”: “You are a skills and AI specialist. ” + “You will provide a score of potential automation with GPT technology for a given task. Follow instructions closely.”},

{“role”: “user”, “content”: “Look at this job task: ” + str(Tasks_GPT) + “It is related to ISCO code: ” + str(ISCO_08) + “Provide a score of potential automation of this task with GPT technology, given that the job is located in a high[low] income country: ” + “The score should range 0-1. Provide a score in one line, and a justification in next line. Do not provide any other commentary, only the score and justification. ” + “Do not give any ranges just one score for each task.”}

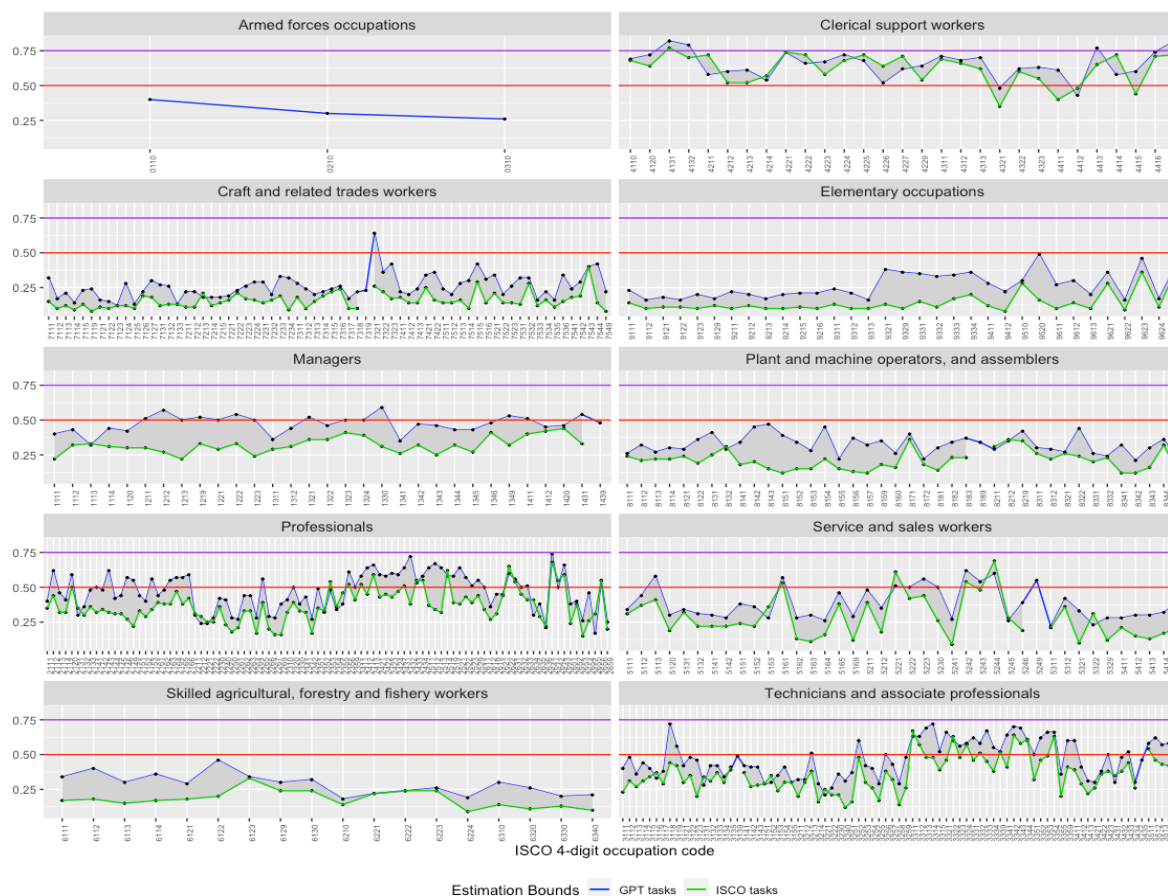
ISCO-08	ISCO Tasks		Justification by GPT
2341	Preparing daily and longer-term lesson plans in accordance with curriculum guidelines;	0.60	GPT technology can aid in the generation of lesson plans and offer suggestions based on curriculum guidelines, but a human teacher's expertise and nuanced understanding of their students' needs will still be important for crafting effective plans.
2341	Instructing children individually and in groups, using various teaching methods and materials (e.g. computers, books, games), adapting to children's varying needs;	0.30	GPT technology can assist in providing instructional materials and adaptive learning approaches, but the physical presence, emotional connection, and real-time adaptability of a human teacher are essential for effectively teaching young children.
2341	Maintaining discipline and good working habits in the classroom;	0.15	GPT technology can assist in monitoring and providing feedback, but it cannot fully automate maintaining discipline and good working habits in the classroom because human interaction and physical presence are essential for effective discipline and enforcing rules.

► **Semantic ML-based clustering of tasks with high automation potential (score > 0.8)**



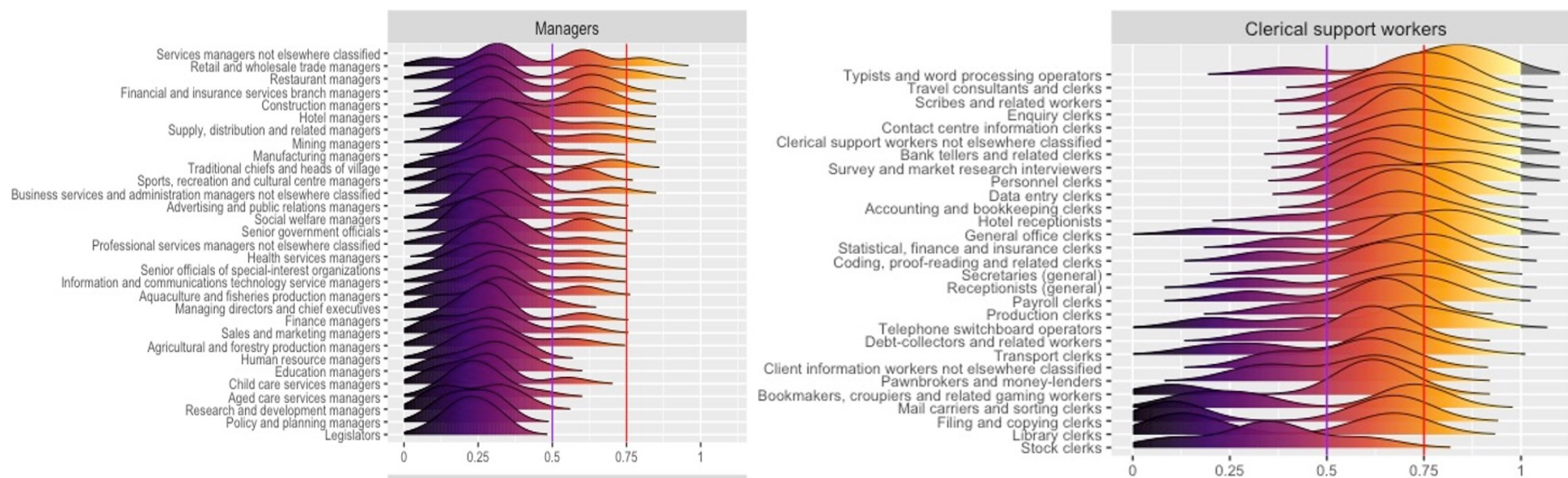
Mean GPT-automation scores by occupation, based on ISCO and GPT tasks

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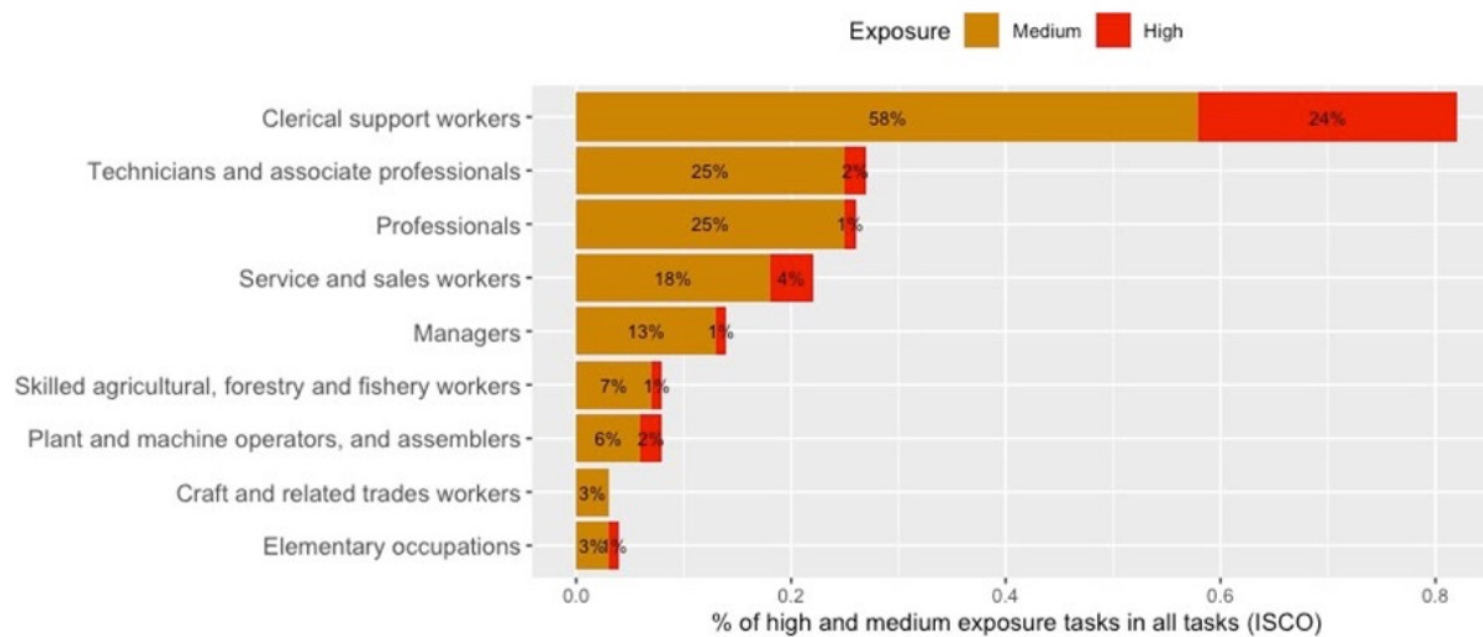
Source: Gmyrek et al., 2023.

► Task-level GPT-exposure scores by ISCO 4d, comparison of managers and clerical support workers

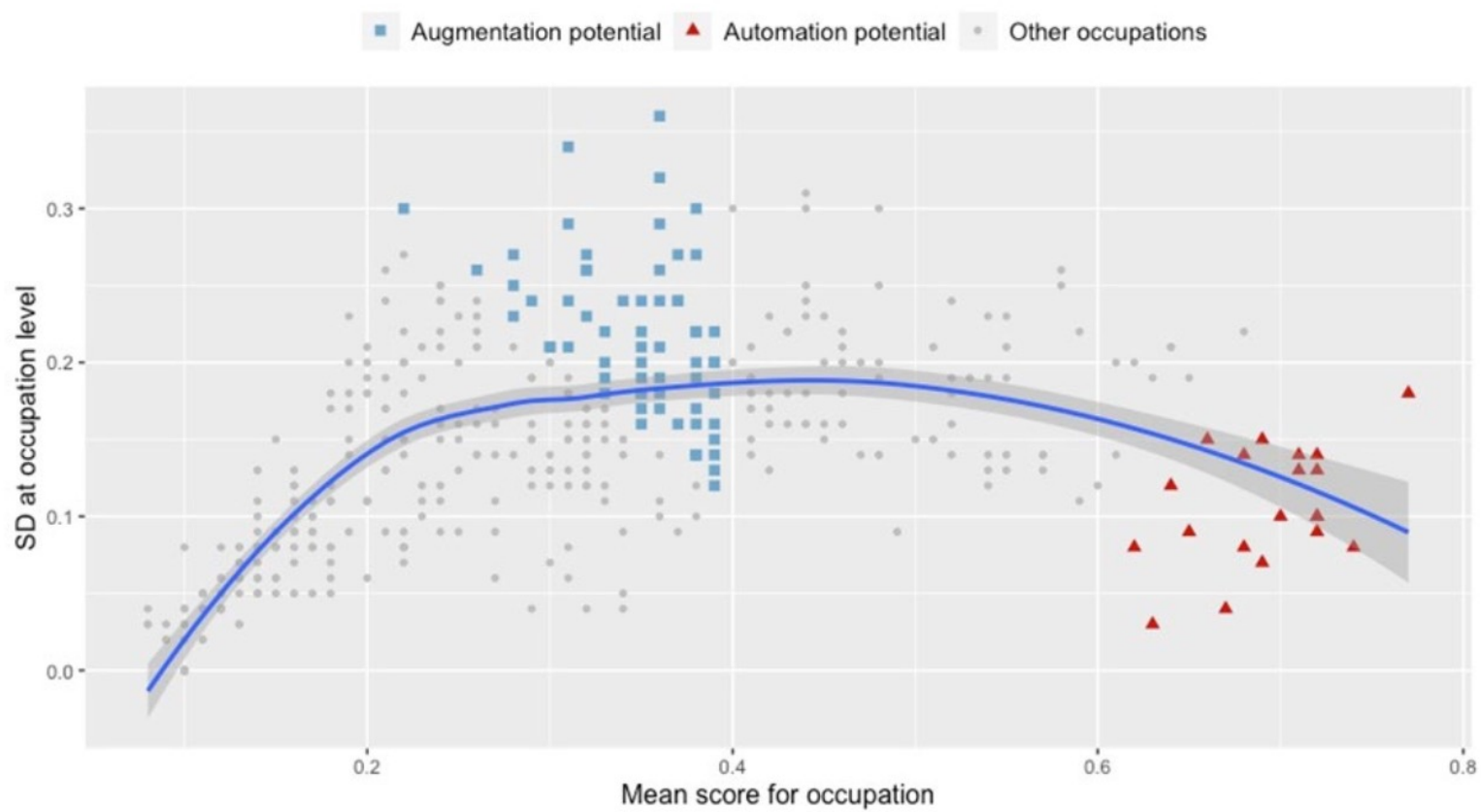


Source: Gmyrek et al., 2023.

► **Figure 2. Tasks with medium and high GPT-exposure, by occupational category (ISCO 1-digit)**



► **Figure 4. Augmentation vs automation potential at occupational level**

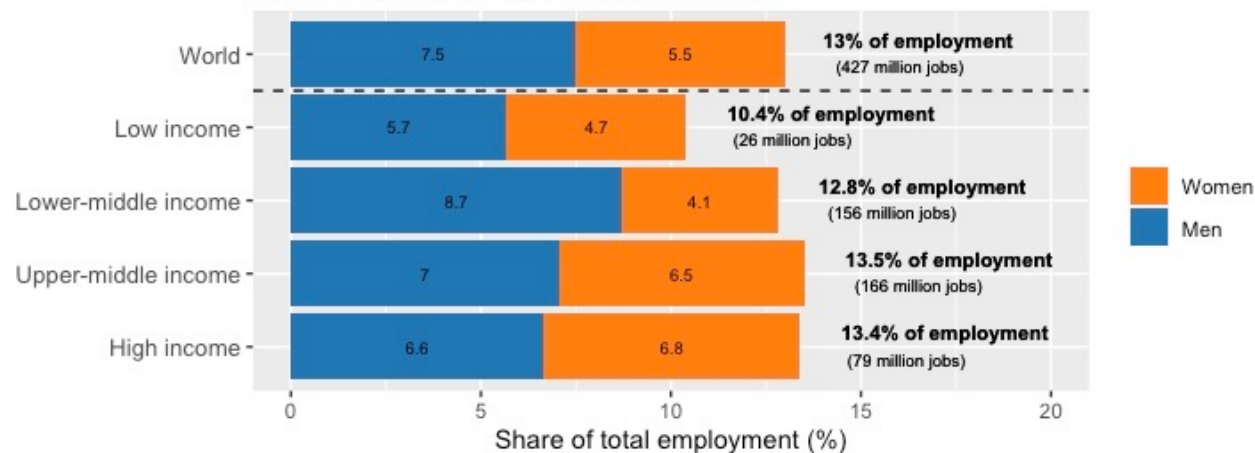


Share of workforce
POTENTIALLY
affected (real impact
will be much less)

Does not account for
new jobs that will be
created!

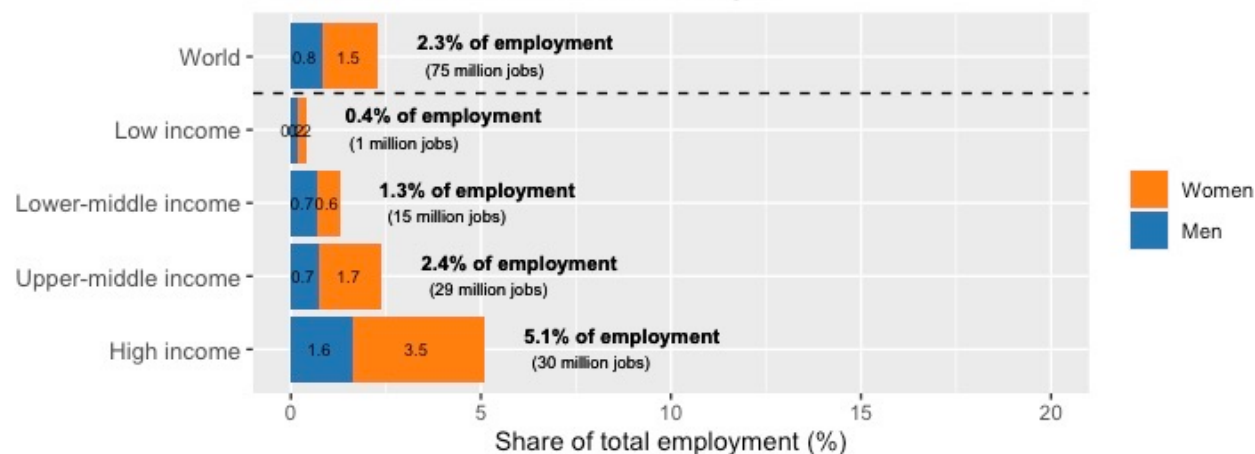
Augmentation Potential

Global estimates: shares and numbers of jobs

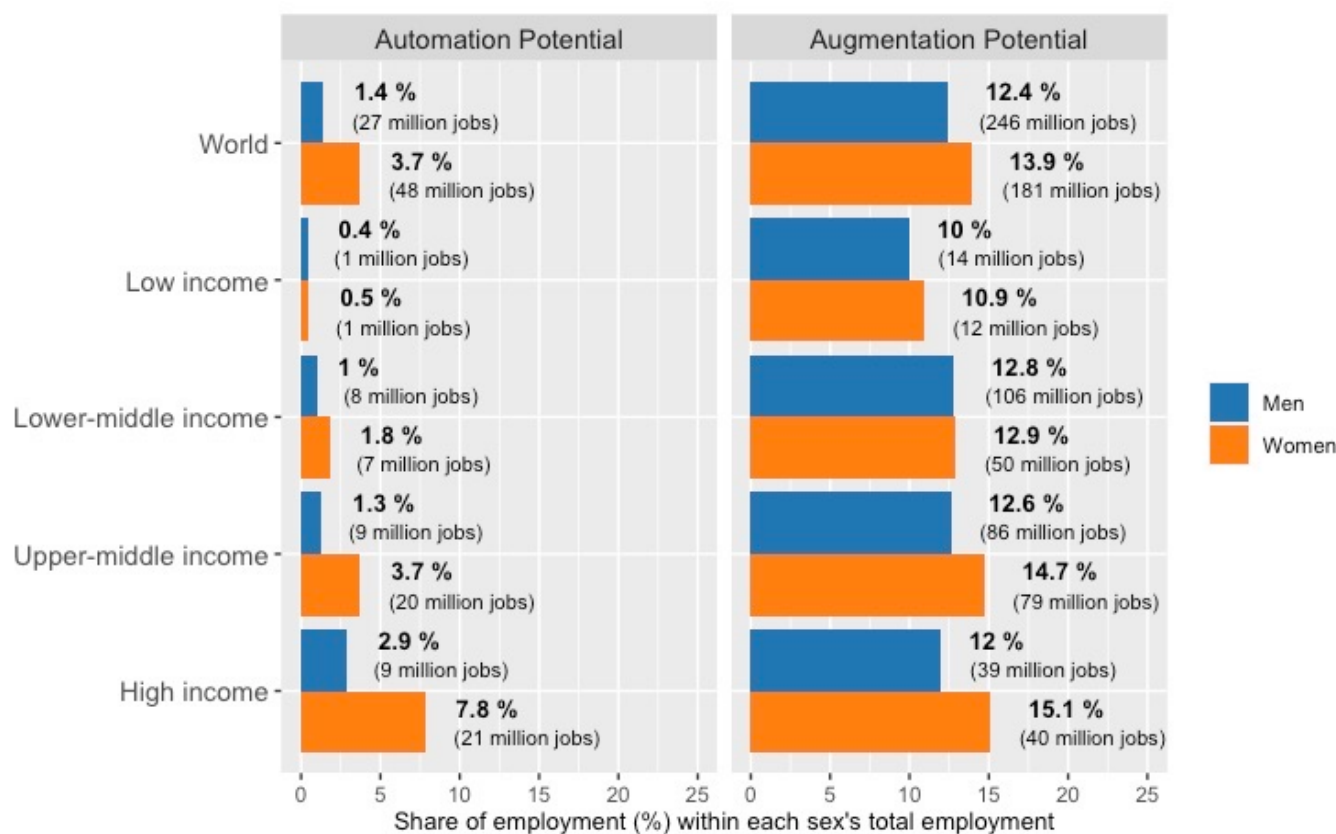


Automation Potential

Global estimates: shares and numbers of jobs



- Effects are highly gendered with 2,5x as many women potentially affected by automation (reflecting occupational segregation in LM)



► Managing the transition – time for action

Mitigating the negative effects of automation

- Prioritize redeployment and training over job loss per Employment Protection Convention (No. 158) through social dialogue
- Provide social protection and skills development to those affected, with particular attention to gender
- Invest in sectors that are under-funded and which have the potential to be a source of good quality jobs (care economy, green economy)
- Ensure that new jobs that are created are of good quality – training AI systems

► Concerns over the quality of some AI jobs

Training AI systems

- global workforce involved in the training of AI systems; estimated by WB at 150 million workers
- primarily on crowdsourcing platforms
 - many often classified as independent contractors lacking rights and benefits
- 2025-2026 standard-setting discussion at ILO on «Decent work in the platform economy»



«Augmentation» also requires policy action

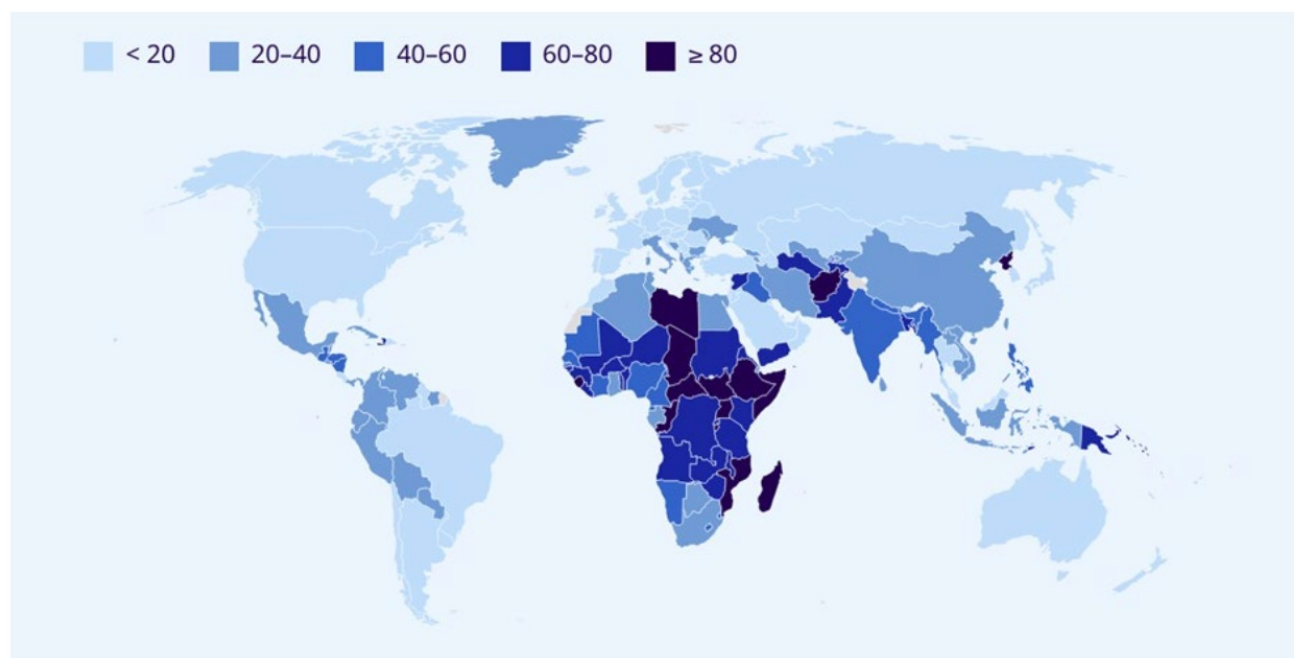
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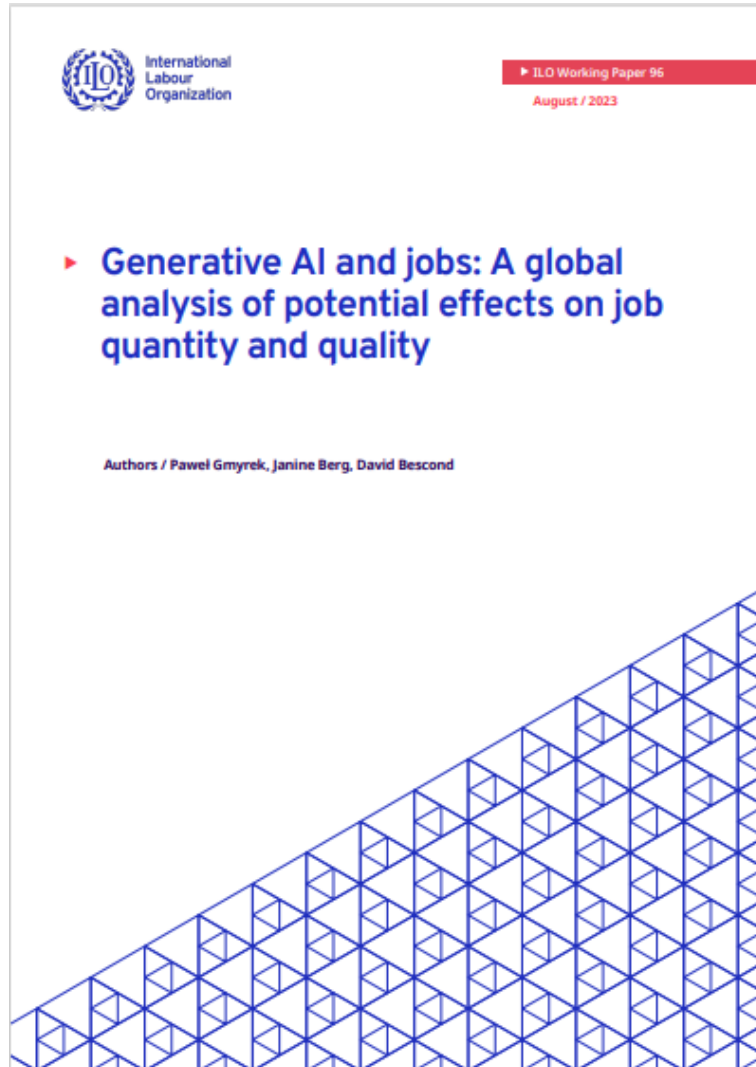
- ▶
 - Integration of AI into work can affect working conditions either positively or negatively depending on how it has been designed
 - importance of workers' participation in the design process with scope for feedback and re-design (best practice in the Nordic countries)
 - Regulatory safeguards
 - Prohibit worker monitoring and data collection outside of work or in contexts where it poses risks to human dignity or the exercise of fundamental rights.
 - Consider other regulatory safeguards such as requiring human oversight in decisions on dismissal.
 - Invest in digital skills



► Global Action Required: closing the digital divide

► Figure 11. Share of population not using the internet¹⁴





► Informe de investigación

Noviembre 2023

La Inteligencia Artificial generativa y el empleo: Políticas para gestionar la transición

Informe de investigación basado en el documento de trabajo No. 96

Paweł Gmyrek, Janine Berg, David Bescond

Puntos clave

- **Los avances en el desarrollo de la IA Generativa** (GenAI) han generado preocupación por sus posibles efectos sobre el empleo, en particular para los trabajadores de cuello blanco y los del sector del conocimiento. El documento de trabajo No. 96 proporciona un análisis global exhaustivo, centrado en la exposición de varias ocupaciones a la GenAI, oficina, los efectos de la automatización serán mayores para ellas.
- **Aprovechar el impulso político y social:** Aprovechando el interés actual por la GenAI, las acciones políticas deben ser tanto preventivas (anticipando los cambios) como correctivas (abordando las preocupaciones). Las políticas deben desarrollarse a través de la participación colectiva de



Thank you!