

# IA for good – Challenges & Opportunities at Brazil

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MINISTÉRIO DO  
TRABALHO E EMPREGO



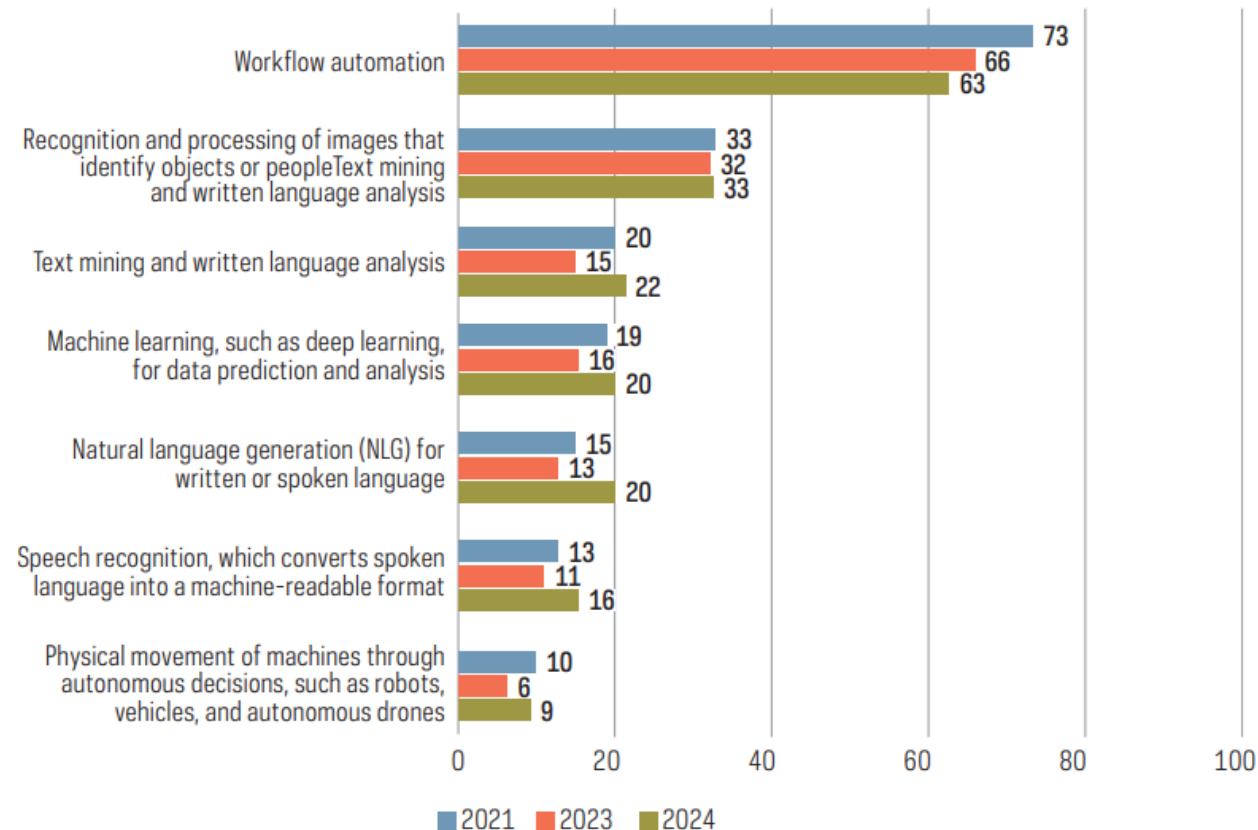
# The duality of labour market is always present

- From one side: big enterprises (mineral sector, public enterprises) with a group of professionals with good education and large experience on IA products (we could think in a sort of “*technocracy*”);
- From Other side - labor precariation of “data Workers” and “Platform Workers” are challenging terms and conditions of employment .

How can we use AI to narrow inequalities? Is this possible?

# Main uses confirms the automation on workflow, recognition and processing images, mining information and texts, use of machine learning

Enterprises that used AI technologies, by type (2021–2024)  
Total number of enterprises that used AI technologies (%)

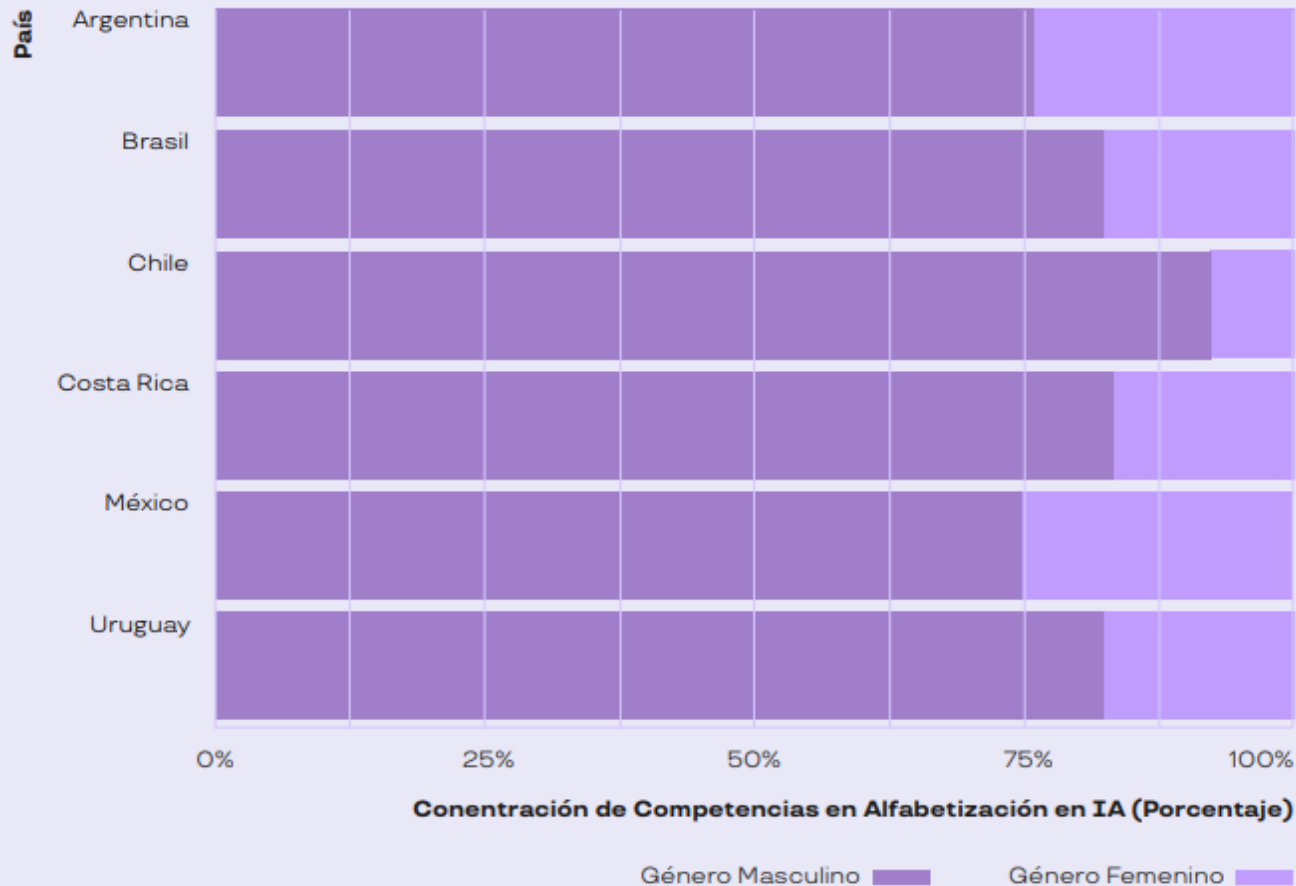


# What occupations were more frequent related with AI

- An experimental study with companies in São Paulo, using UNESCO methodology, showed that the most sought-after professionals were:
- **data protection officers;**
- **and management positions for information departments;**
- **risk departments,**
- **statisticians and data engineers;**
- **data scientists, machine learning applications developers.**
- **Professionals who involve high levels of IT knowledge and information use in addition to IT techniques**

## Who are the worker of those occupation on AI

**Gráfico 10:** Distribución del Talento en IA según género:  
Competencias de Alfabetización en IA (2023)

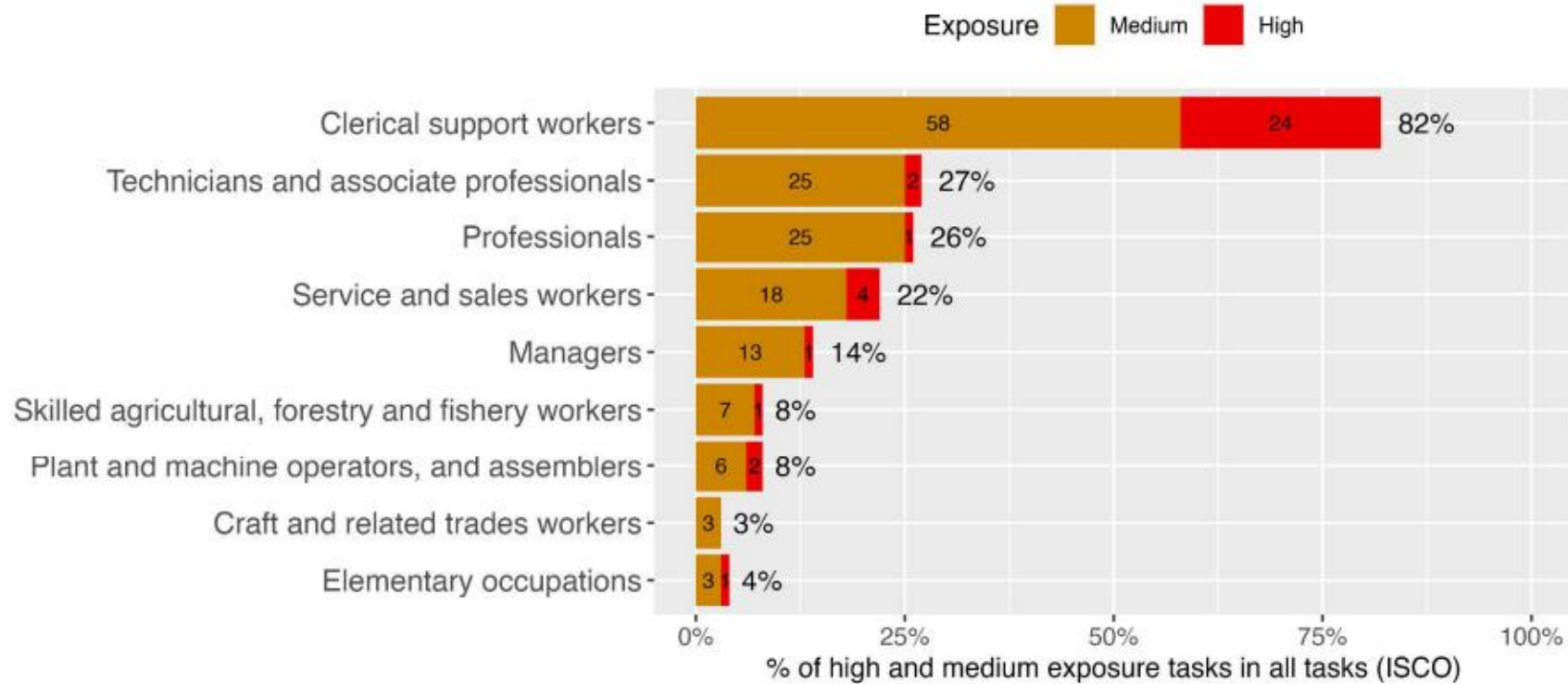


Fuente: Elaboración propia en base a datos de LinkedIn.

Almost 80% of this Workers are man in Brazil and Other countries in Latin America

# Which are the occupations more expected to be affected by AI

## Clerical support workers are most exposed to risk of automation



Source: Gmyrek et al., 2023.

in Brazil those occupational groups correspond to: **around 15 million people in the formal sector that will be affected in some ways in a few years**

**On those groups there are more women**

# 1 Brazilian Exercise to understand automation of occupations, with enfases on AI

- Hypotheses :
- If we know what the repetitive tasks are, we could estimate how these task could affect occupations
- As we have only indications on the use of AI and other forms of automation, we could considere the risk associated with the implementation of automation and AI
- If there are risks, there are also preservation aspects that could retard or at list prevent the automation and IA for the moment

## 2. Structure and Historical of CBO:

- Criation: 1997
- Actual version: Ministerial Decree **397/2002** + **last atualizaton jan/2025**
- Ministerial Decree **671/2021**.
  - ❖ CBO is used in labor administrative data, to statistics classificatory purpose

## Estrutura da CBO

✓ Estrutura Hierárquica.

✓ Example: **Engenheiro**.

✓ Grande grupo: **2 – Ciência e Artes**.

✓ Subgrupo Principal: **21 – Ciências exatas, física e engenharia**.

✓ Subgrupo: **214 – Engenharia e Arquitetura**.

✓ Família Ocupacional : **2144 – Engenheiro Mecânico**.

✓ Ocupação: **214410: Engenheiro Mecânico Automotivo**.

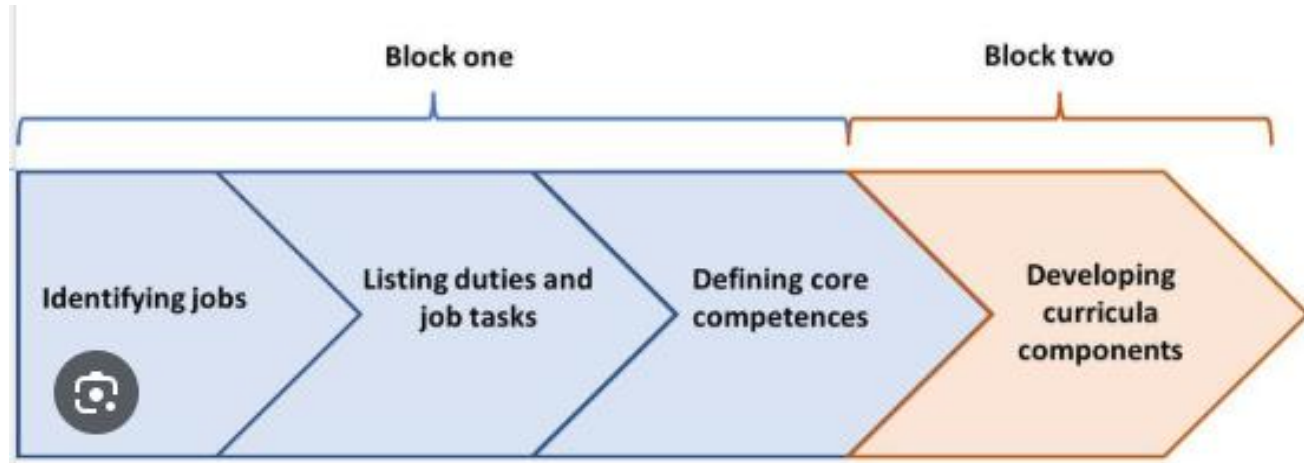
✓ Sinônimos:

1. Engenheiro de manutenção de carros.
2. Engenheiro mecânico de automóveis.
3. Engenheiro mecânico (veículos).



➤ DACUM – Method of job & occupation analysis

➤ THE WORKER IS THE SPECIALIST ON DESCRIBE THEIR TASKS



- The DACUM (Developing A Curriculum) method is a job analysis technique that involves a group of expert workers and a facilitator to identify and map the tasks, duties, and skills of a specific occupation.
- It is a "task-first" approach used for designing training programs, creating job descriptions, and evaluating performance, with the goal of ensuring training is relevant, up-to-date, and based on real-world job requirements.
- The process results in a comprehensive occupational profile chart that serves as a foundation for curriculum development and other workforce planning initiatives.

### 3. Methodological path

- Risk classification criteria:
  - Distribution of data without prior labels.
  - Definition of risk and protection hypotheses for verification and classification of the probability of an occupation being replaced by AI or consequent automation.
- **Risk:** Repetitive, Defined rules, Little social interaction, Susceptible to replacement, Standardized tasks.
- **Protection:** Creativity, Empathy or emotional intelligence, Complex problem solving, Ethical or subjective judgment, Physical manipulation and direct inspection.
  - Use of specialized literature to support the work.
- **Data used:**
  - CBO database:
    - CBO code, Occupation title, Occupational description, GAC, Activities

# Painel Riscos CBO de Automatização de ocupação

Visão Histograma

Limpar todas as segmentações

Código Ocupação

Ocupação

Atividade

Tudo

NURSE

Tudo

## Histograma de Risco e Proteção por Ocupação

Risco Final

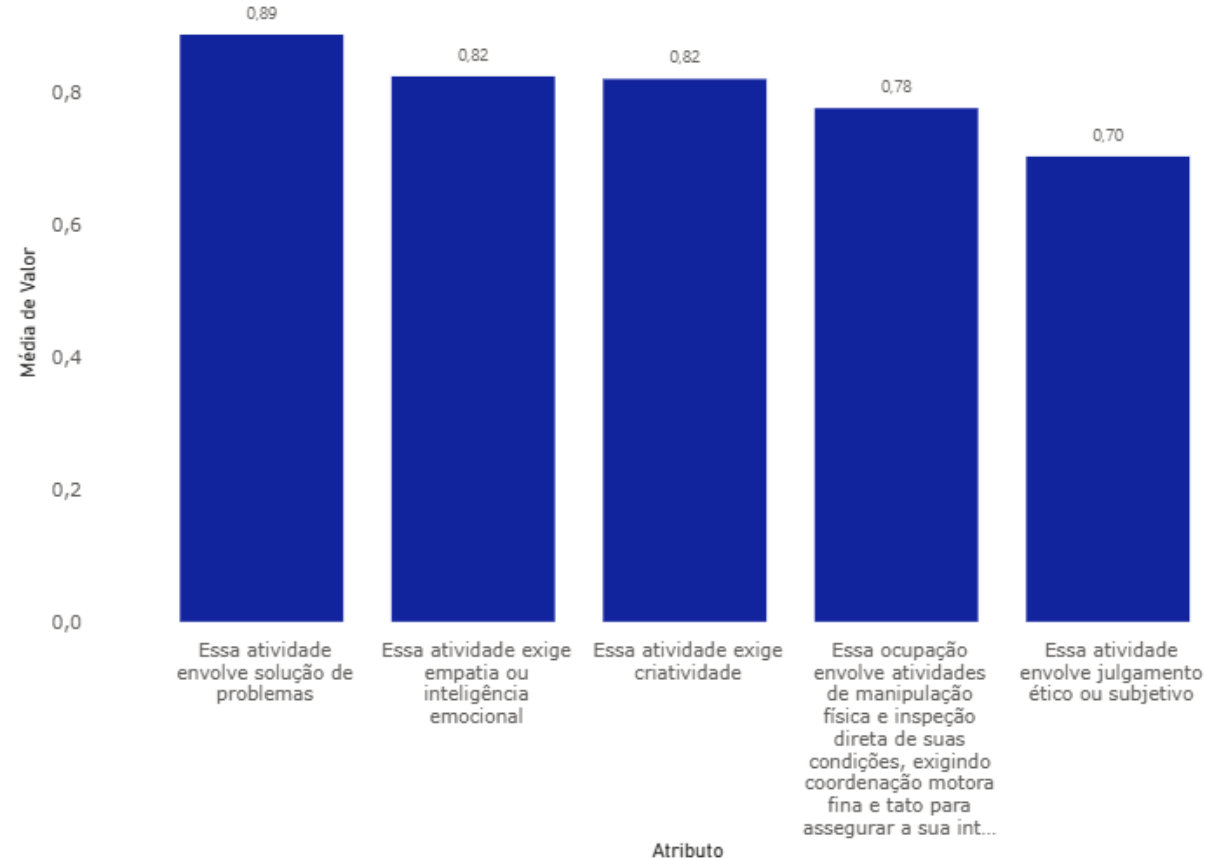
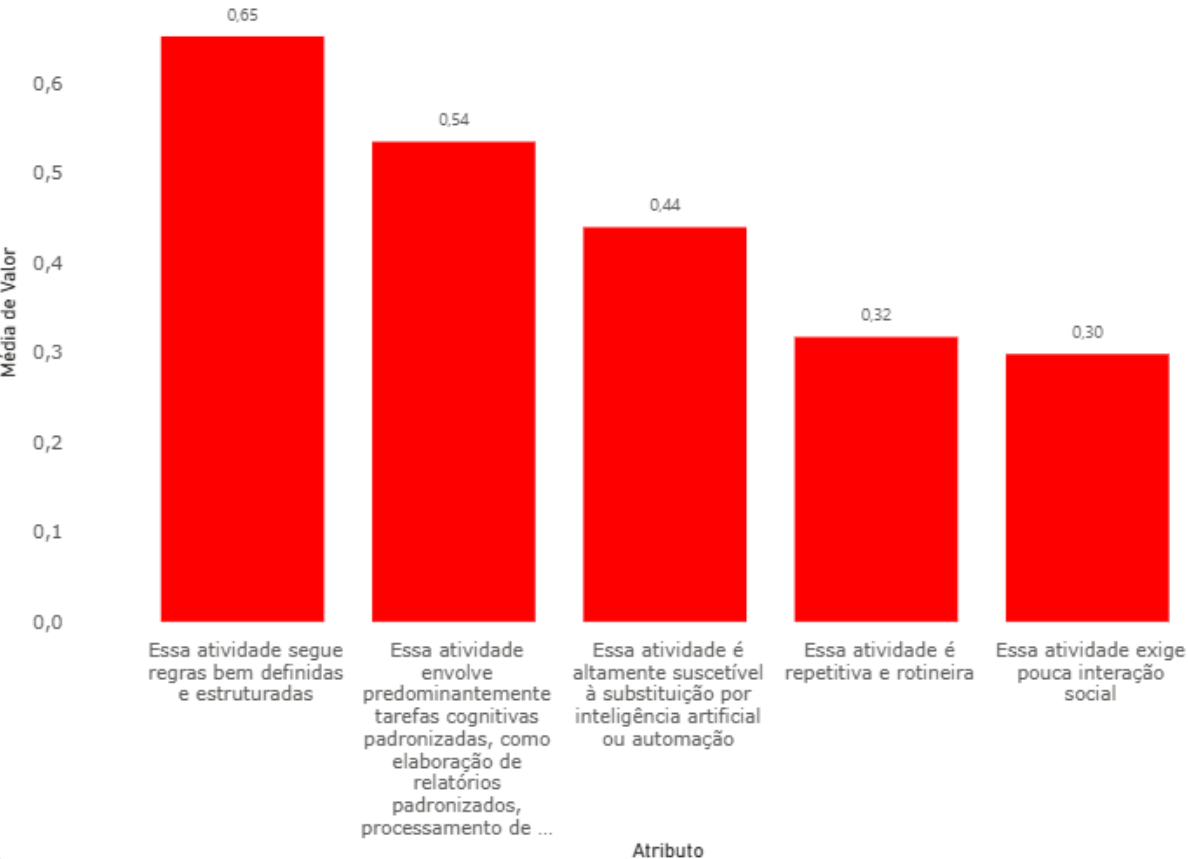
BAIXO

Média Risco

0,267

● Risco

● Proteção



# 4. Contrafactual data

## NURSES

[riscoCBO.xlsx](#)



### AS OCUPAÇÕES E O MERCADO DE TRABALHO (ASSALARIADO FORMAL)

[voltar para o início](#)

Selecione uma ocupação

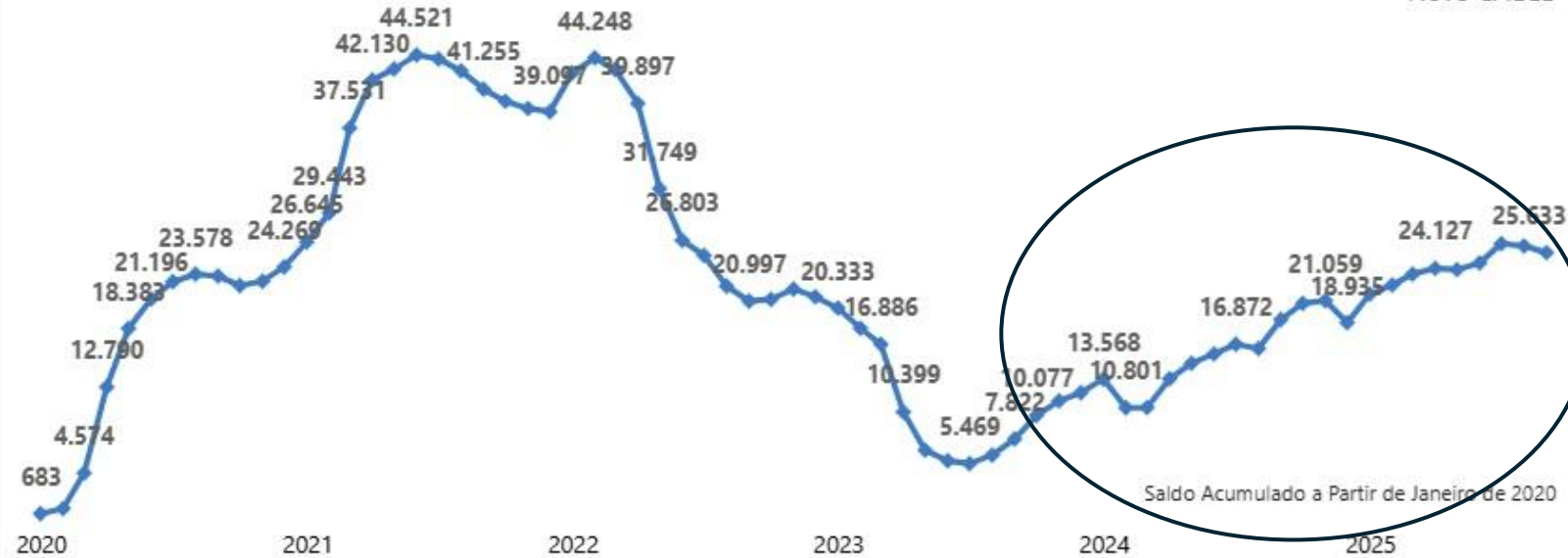
223505 - Enfermeiro

#### Características do trabalhador

Sexo	Raça Cor
Todos	Todos
Escolaridade	Nacionalidade
Todos	Todos
Faixa Etária	Tipo de Deficiência
Todos	Todos

Admissões/Desligamentos | Saldo da Movimentação | Estoque Mensal | **Varição Acumulada**

Novo CAGED



Saldo Acumulado a Partir de Janeiro de 2020

# Main results of these experimental approach

- Considering the **609 occupational families**
  - Very High Risks - 12 occupational families (technical occupations on informations tech, operators of computer numeric control machining machines)
  - High Risks - 93 occupational families (technical occupation, supervisors, designers);
  - Medium Risks – 192 occupational families;
  - Low Risks – 252 occupational families
  - Very Low Risks -60 occupational families (basic manual occupations, cultural occupations).

Number of Occupation by Risk

Very Low  
328

Low  
1.070

Medium  
760

High  
368

Very High  
95

Number of Occupation by Risk

Very Low  
13.578

Low  
12.178

Medium  
8.662

High  
6.805

Very High  
5.661

# The analysis of data – first impressions

There are many aspects to consider from the aggregated results by families, occupations, and tasks.

- How long ago was the occupation described and how accurate the description of task are today;
- Description of the use of standardized cognitive tasks, such as reports and other data processing programs.
- How much social interaction is necessary
- how is the perception of automation of the occupation by the workers;
- How important is problem-solving and creativity
- How much does subjective or ethical judgment matter

# How these informations will Interact with knowledge, skills and atitudes?

- Knowledge, skills, and attitudes are another level of information that is fundamental to the educational system
- K, S, A are connected with different tasks at same time in different proportions, do we know with ones are more important?
- The basic level is enough? Should different weights be given to each aspect? Which elements should be considered?
- How could these be informed technical and vocational education

# Recomendation

- Follow studies on occupational risk connected to the use of AI;
- Do more research about skills that are more necessary to the digital economy
- Promote more skilling and reskilling for occupations that are more at risk
- Change curricula considering the new tasks on the occupation
- Promote literacy to other workers (with new methodologies to taught adults )

Thank you

Paula Montagner